PB-243 724

OIL SPILL AND OIL POLLUTION REPORTS, FEBRUARY 1975-APRIL 1975

CALIFORNIA UNIVERSITY

PREPARED FOR
NATIONAL ENVIRONMENTAL RESEARCH CENTER

JUNE 1975

DISTRIBUTED BY:

NTIS
National Technical Information Service
U. S. DEPARTMENT OF COMMERCE

218078

EPA-670/2-75-059
June 1975

Environmental Protection Technology Series

PB 243 724

OIL SPILL AND OIL POLLUTION REPORTS
February 1975 — April 1975

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
US Department of Commerce
Springfield, VA. 22151

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-670/2-75-059	2.	3. RECIPIENT'S ACCESSION NO. PB243724

4. TITLE AND SUBTITLE OIL SPILL AND OIL POLLUTION REPORTS February 1975 - April 1975	5. REPORT DATE June 1975 (Issuing Date) 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Floyd A. DeWitt, Jr., and Penelope Melvin	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Marine Science Institute University of California Santa Barbara, California 93106	10. PROGRAM ELEMENT NO. 1BB041 (ROAP 21BEA, Task 008) 11. ~~CONTRACT~~/GRANT NO. R-803063
12. SPONSORING AGENCY NAME AND ADDRESS National Environmental Research Center Office of Research and Development U.S. Environmental Protection Agency Cincinnati, Ohio 45268	13. TYPE OF REPORT AND PERIOD COVERED Quarterly, Feb. 1975-Apr. 1975 14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

See also EPA-670/2-75-003 (PB-240 719) and EPA-670/2-75-044

16. ABSTRACT

This report is the third quarterly compilation of oil spill events and oil pollution report summaries. Presented in the report are: (a) summaries of oil spill events; (b) summaries and bibliographic literature citations; (c) summaries of current research projects; and (d) patent summaries. This report is submitted in partial fulfillment of EPA Grant No. R-803063 by the Marine Science Institute, University of California, Santa Barbara, under the sponsorship of the Environmental Protection Agency.

PRICES SUBJECT TO CHANGE

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Bibliographies Summaries Patents Documents Research	Oil pollution Oil spill events Oil spill research Oil pollution control Oil pollution patents	13B

18. DISTRIBUTION STATEMENT RELEASE TO PUBLIC	19. SECURITY CLASS *(This Report)* UNCLASSIFIED	21. NO. OF PAGES 248
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE $7.50

EPA Form 2220-1 (9-73)

☆ U. S. GOVERNMENT PRINTING OFFICE 1975-657-594/5406 Region No. 5-11

EPA-670/2-75-059
June 1975

OIL SPILL AND OIL POLLUTION REPORTS

February 1975 - April 1975

By

Floyd A. Dewitt, Jr., and Penelope Melvin
Marine Science Institute
University of California
Santa Barbara, California 93106

Project No. R803063
Program Element No. 1BB041

Project Officer

J. S. Dorrler
Industrial Waste Treatment Research Laboratory
Edison, New Jersey 08817

NATIONAL ENVIRONMENTAL RESEARCH CENTER
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

For sale by the Superintendent of Documents, U.S. Government
Printing Office, Washington, D.C. 20402

i(a)

REVIEW NOTICE

The National Environmental Research Center--Cincinnati has reviewed this report and approved its publication. Approval does not signify that the contents necessarily reflect the views and policies of the U.S. Environmental Protection Agency, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

FOREWORD

Man and his environment must be protected from the adverse effects of pesticides, radiation, noise and other forms of pollution, and the unwise management of solid waste. Efforts to protect the environment require a focus that recognizes the interplay between the components of our physical environment--air, water, and land. The National Environmental Research Centers provide this multidisciplinary focus through programs engaged in

- studies on the effects of environmental contaminants on man and the biosphere, and
- a search for ways to prevent contamination and to recycle valuable resources.

The compilation and dissemination of pertinent information is essential to understanding and management of the environment.

This report is the third in a series of quarterly reports highlighting research and literature dealing with the prevention, control and cleanup of oil spills.

A. W. Breidenbach, Ph.D.
Director
National Environmental Research
Center, Cincinnati

ABSTRACT

The February 1975 - April 1975 Oil Spill and Oil Pollution Report is the third quarterly compilation of oil pollution report summaries.

The following topics are included in the report:

a) Summaries and bibliographic literature citations;
b) Current status of some of the research projects as listed in Reports I and II;
c) Summaries of additional current research projects; and,
d) Patent summaries.

This report is submitted in partial fulfillment of EPA Grant No. R803063 by the Marine Science Institute, University of California, Santa Barbara, California, under the sponsorship of the Environmental Protection Agency.

CONTENTS

Page

Abstract iv

Acknowledgments ix

Introduction x

Sections

I Publications and Reports

A. Oil Pollution Detection and Evaluation

1. Reporting 1

2. Monitoring 6

3. Remote Sensing 15

4. Sampling 17

5. Analysis 18

B. Oil Pollution Control

1. Containment 31

2. Cleanup and Recovery 37

C. Effects of Oil Pollution

1. Biological Effects 52

2. Physical Effects 70

3. Chemical Effects 71

(cont'd) Page

D. Oil Pollution Prevention

1. Design and Engineering 72

2. Oil Handling 75

3. Waste Water Treatment 77

4. Research 86

5. Regulations, Standards and Planning 88

E. Effects of Oil Prospecting and Production

1. Biological Effects 91

2. Physical Effects 95

3. Economic Effects 96

4. General Effects 97

F. Fate of Oil in the Environment

1. Biological Degradation 101

2. Chemical Changes 108

3. Physical Changes 110

4. General Fate of Oil 113

G. Oil Pollution Legislation

1. State Legislation 114

2. National Legislation 115

3. International Legislation 117

4. Foreign Legislation 119

H. Bibliographies 121

(cont'd) Page

II Current Status of Some of the Research Projects as Listed in Previous Reports

A. Oil Pollution Detection and Evaluation

1. Monitoring 123
2. Remote Sensing 126
3. Analysis 130

B. Oil Pollution Control

1. Containment 135
2. Cleanup and Recovery 136

C. Effects of Oil Pollution

1. Biological Effects 137
2. Physical Effects 155
3. Economic Effects 157
4. General Effects 158

D. Oil Pollution Prevention

1. Oil Handling 159
2. Waste Water Treatment 161
3. Research 162

E. Fate of Oil in the Environment

1. Biological Degradation 164
2. General 172

F. Legal Aspects of Oil Pollution 173

(cont'd) Page

III Current Research Projects

A. Oil Pollution Detection and Evaluation

1. Monitoring 174

2. Remote Sensing 175

3. Analysis 176

B. Oil Pollution Control

1. Containment 178

2. Cleanup and Recovery 179

C. Effects of Oil Pollution

1. Biological 181

2. Physical 185

D. Oil Pollution Prevention

1. Design and Engineering 186

2. Waste Water Treatment 187

3. Personnel Training and Education 188

4. Research 189

E. Fate of Oil in the Environment

1. Biological Degradation 190

F. Legal Aspects of Oil Pollution 192

IV Patents

A. United States Patents 193

B. Foreign Patents 216

Topic Cross Reference 230

Appendix 232

ACKNOWLEDGMENTS

The authors would like to thank Ms. Robin Quetin for assisting in compiling and summarizing entries, and Ms. Mary Ankeny and Ms. Yvonne Pommerville for typing the camera-ready copy of Oil Spill and Oil Pollution Reports. Suggestions for improvement of the format or content will be gratefully received.

INTRODUCTION

The purpose of the "Oil Spill and Oil Pollution Reports" series is to present a concise, comprehensive information source on oil pollution events, current research and oil pollution related publications. This is the third quarterly edition of "Oil Spill and Oil Pollution Reports." Included are bibliographic citations and summaries of articles from the scientific and technical literature (Section I), the status and results of Current Research Project entries listed in Reports I and II (Section II), additional Current Research Projects (Section III), and oil pollution related patents (Section IV). Unlike the first edition, a section on oil spill events is not included, but will appear in subsequent oil pollution reports.

The sources of the bibliographic citations and summaries of articles presented in Section I are scientific, technical and abstract journals. A list of the periodicals reviewed is provided in the appendix. The summarized material is grouped according to subject and then arranged alphabetically by senior author within each subject division. New subject headings have been added to the subject outline and include subtopics relating to the Fate of Oil in the Environment (Biological degradation, Physical changes, Chemical changes and General), and subtopics covering areas of Waste Water Treatment and oil pollution Regulations, Standards and Planning (listed under the heading Oil Pollution Prevention). Bibliographic citations, as well as Current Research Project entries appearing in this report are arranged according to the expanded subject outline.

Section II lists Current Research Project entries appearing in Reports I and II and includes descriptive project information provided upon request by the principal investigators and/or performing organization. All reports and publications are entered in summary form. The entries in Section II are not complete in that status information is not given for all research projects listed in Reports I and II. Some responses to request letters were not received prior to publication date. At the end of each entry, the name and address of the project information source are given.

Current Research Project summaries (Section III) are grouped according to subject and then arranged alphabetically by senior principal investigator within each subject division. Some of the Current Research Projects listed in previous Oil Pollution Reports have been recently renewed. These projects have been relisted and are headed by the same serial number as originally reported, followed by the word (Renewal). All the research project information was obtained from the Smithsonian Science Information Exchange (SSIE).

Patent summaries are divided into United States and foreign subsections and arranged alphabetically by inventor in each section. All patent information is obtained from abstract journals. Illustrations of United States patented devices are obtained from the U.S. Patent Office Official Gazette.

All report entries are serialized. Each section has its own number series. The serial numbers in this report are a continuation of the numbering system appearing in Reports I and II. The letters preceding the serial numbers designate the following sections: C, citations from the literature; R, research projects; P, patents. This number series will continue in subsequent reports. Many of the entries can be included under more than one subject heading. Following each summary are listed any other topics under which the entry can be categorized. A subject cross index is provided at the end of the report.

SECTION I. PUBLICATIONS AND REPORTS

A. OIL POLLUTION DETECTION AND EVALUATION

1. REPORTING

C-448-74
(no title)

Anon. 1975.
Ocean Oil Weekly Report 9(16):1.

A report entitled "Petroleum in the Marine Environment," prepared by the Ocean Affairs Board of the National Research Council, National Academy of Sciences, has indicated that oil pollution entering the oceans from offshore oil operations is the least significant oil pollution source. River and urban runoff, coastal refineries, industrial wastes and natural seeps are reported as more significant sources of oil pollution, with transportation operations rated as the greatest contributor.

Citation Source: Citation Journal.

C-449-74
HOW MUCH OIL IS SPILLED

Anon. 1975.
Science News 107(3):41.

The article reports the estimates made by the Ocean Affairs Board of the National Research Council of the amount of oil contamination in the oceans. The Board favors a conservative estimate of around 6.1 million tons/year, with severe ecological effects in localized areas. The researchers emphasize that knowledge in this area is grossly inadequate and further studies are needed to determine the actual biological effects of oil and dispersants.

Biological effects of oil pollution

Citation Source: Citation Journal.

C-450-74
LIBERIAN TANKER SPILLS BUNKER C IN BANTRY BAY

Anon. 1974.
The Oil and Gas Journal 73(3):49.

The article reports the spilling of 451 tons of bunker fuel into Bantry Bay, Ireland, as a result of the collision of a supertanker and a tugboat. Cleanup operations are reported to be underway.

Citation Source: Citation Journal.

C-451-74
OIL SPILL PERSPECTIVES

Anon. 1975.
Chemistry in Canada 27(1):9.

Possible quantities of spilled oil and tar off the British Columbia coast, as stated by Canada's prime minister, Jeanne Sauve, are reported in the article. Sauve's comments given at a Marine Pollution Symposium on future environmental management and comprehensive approaches to marine pollution prevention are also presented.

Citation Source: Citation Journal.

C-452-74
SEVENTEEN OIL SPILLS IN NORTH ALASKA SINCE 1969

Anon. 1975.
Science News 104(6):86-87.

Although construction of the Trans-Alaska Pipeline will not begin until summer, 1975, at least seventeen oil spills have been reported at facilities on the slopes since drilling began in 1969. Oil spill events, spill recovery and caution on the part of the oil companies are discussed.

Citation Source: Citation Journal.

C-453-74
TRANSLATIONS ON ENVIRONMENTAL QUALITY, NO. 48

Anon. 1974.
Translations of Monographs from various journals. 53 p.

A section on the increasing dangers of oil pollution in Gulf waters is one of the topics included in the translations.

Citation Source: Government Reports Announcements. 1974.
74(23). Entry #JPRS-62763.

C-454-74
OIL ACCIDENTS ENDANGERING WATER SUPPLIES. II: THE PRESENT STATE OF THE PROBLEM

Boettcher, F. 1973.
GWF Wasser Abwasser 114(10):488-489.

The report surveys statistical data on the occurrences and causes of oil spills in the Federal Republic of Germany from the period 1964 to the present. Oil leakage from tankers, discharges of excess oil in various locations, and poor maintenance of equipment are reported as some of the frequent causes of oil pollution.

Citation Source: Environmental Health and Pollution Control.
1974. 6(1). Entry #244.

C-455-74
GROUNDED SHIP IS SALVAGE CHALLENGE

Frye, J. 1975.
National Fisherman 55(11):11-B, 15-B.

The article reviews the disastrous grounding of the supertanker *Metula*, chartered by a subsidiary of the Royal Dutch Shell Group, on August 9, 1974. The tanker grounded when it ran out of the 62 ft. depth necessary for passage in the Straits of Magellan. An estimated 54,000 tons of Persian light crude oil were spilled.

Citation Source: Citation Journal.

C-456-74
TROPICAL STORM AGNES PENNSYLVANIA'S TORREY CANYON

Kaiser, R., D. Jones, and H. Lamp'l. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March 1973, Washington, D. C., 4172. p. 569-577.

The paper reports the occurrence of the largest inland oil spill disaster in U. S. history caused by Tropical Storm Agnes, and the actions taken by the Environmental Protection Agency in coping with the oil spill. Major spill effects, cleanup operations and problems encountered are discussed.

Cleanup and recovery

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13018.

C-457-74
AN ANALYSIS OF OIL OUTFLOWS DUE TO TANKER ACCIDENTS

Keith, V. F., and J. D. Porricelli. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March 1973, Washington, D. C., 4172. p. 3-14.

The paper presented an analysis which calculated the amount of oil entering the sea due to worldwide tanker casualties during 1969 and 1970.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q12993M.

C-458-74
ENVIRONMENTAL PROTECTION FOR HARBORS

Monney, N. T. 1973.
Journal of Environmental Sciences 16(4):17-21.

Included in this paper dealing with problems involved with discharges from vessels, is a discussion of oil pollution from vessels. An estimate of 5 million metric tons of oil discharged from nonrecreational ships in 1970 is reported.

Citation Source: Oceanic Abstracts. 1974. 11(6). Entry #05600.

C-459-74
PETROLEUM RESIDUES IN THE SARGASSO SEA AND ON BERMUDA BEACHES

Morris, B. F., and J. W. Butler. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March 1973, Washington, D. C. 41721 p. 521-572.

"Tar lumps" amount to 86,000 metric tons in the Northwest Atlantic; most of the tar is found in the Sargasso Sea. Chemical characteristics suggest that the source of the tar lumps is crude oil sludge from tanker washings. Degradation is on the order of years.

Analysis

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1974. 4(12). Entry #4Q13060M.

C-460-74
TAR POLLUTION OF SIERRA LEONE BEACHES

Okera, W. 1974.
Nature 252(5485):682.

The article reports the appearance of pelagic tar on the sandy beaches of Sierra Leone during the period June, 1973 to July, 1974. The origin and fate of the tar lumps are discussed.

Citation Source: Citation Journal.

C-461-74
THE PRESENT STATE OF CHEMICAL WATER POLLUTION IN THE NORTH ATLANTIC

Simonov, A. I., S. G. Oradovsky, and A. A. Yushchak. 1974.
Meteoroligiia I Gidrologiia 3:61-69.

Information on the amounts of oil, mercury, detergents and pesticides in the North Atlantic in 1972-1973 is presented and the significance of circulation in pollutant transport in these waters is discussed.

Citation Source: Pollution Abstracts. 1974. 6(1). Entry #75-00251.

C-462-74
NATURAL MARINE OIL SEEPAGE

Wilson, R. D., et al. 1974.
Science 184(4139):857-865.

The yearly oil input into the oceans from naturally occurring marine seepage has been estimated to be 0.6×10^6 metric tons/yr. High seep potential areas in the Pacific Ocean are the major contributors.

Citation Source: Citation Journal.

2. MONITORING

C-463-74
COLOR CODING OF OIL SPILLS

Alfonzo, A., and H. G. Schwartzberg. 1974.
Engineering Bulletin, Purdue University, Engineering Extension Series (141). Part 2:939-951.

"Petroleum can be coded by the addition of 0.5 - 10 ppm of oil-soluble dyes. Petroleum concentrations relative to the oil color can be determined by visible light spectrophotometry."

Citation Source: Chemical Abstracts. 1974. 81(22). Entry #140549h.

C-464-74
DICTAPHONE OFFERS HYDROCARBON DETECTOR

Anon. 1974.
Chemical & Engineering News. 52(51):16.

The design and development of a line of instruments used to detect combustible hydrocarbons are described. The systems can be adapted for use wherever hydrocarbons are produced, processed, stored or transported.

Design and engineering

Citation Source: Citation Journal.

C-465-74
OIL CONTENT MONITOR AND CONTROLLER

Anon.
Product Information.

The Hyde Oil Content Monitor is a detection instrument which is reported to provide continuous surveillance of waste streams and treatment system effluents. It is able to measure trace quantities of oil as low as 1 ppm. The operation, features and specifications of the monitor are given.

Design and engineering

Information Source: E. E. Heidenreich, Hyde Products, Inc., 810 Sharon Dr., Westlake, Ohio 44145.

C-466-74

OIL SPILL DETECTOR

Anon. 1974.
Environmental Science & Technology 8(10):948.

The operation of a floating unit which is useful in the detection and recovery of spilled oil is described.

Cleanup and recovery

Citation Source: Citation Journal.

C-467-74

WIDESPREAD OIL AND PLASTIC CONTAMINANTS IN ATLANTIC

Anon. 1974.
Sea Technology 52(2):25-27.

Two NOAA surveys, conducted in 1972 and 1973, examined the extent of floating oil and plastic contaminants in the U. S. East Coast oceanic waters. Oils and plastics appeared in every area sampled and >50% of all plankton samples were tainted with oil.

Biological effects of oil pollution

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(9). Entry #4Q9552M.

C-468-74

LASER RAMAN SPECTROSCOPY OF SOLUTES DISSOLVED IN WATER FROM A REMOTE PLATFORM

Brown, C. W. 1974.
U. S. NTIS Report PB 233 432/4GA. 19 p.

An optical system for obtaining remote Raman spectra of ionic solutes dissolved in water was developed for use in detecting NO_3^-, oil slicks on water surfaces, and dissolved SO_4^{2-}, PO_4^{2-}, and CO_3^{2-}.

Citation Source: Chemical Abstracts. 1975. 82(6). Entry #34895d.

C-469-74
PELAGIC TAR FROM BERMUDA AND THE SARGASSO SEA

Butler, J. N., B. F. Morris, and J. Sass. 1973.
Bermuda Biological Station for Research, Special Publication (10): 1-346.

From surveys of pelagic tar lumps in the Atlantic Ocean, it has been reported that highest concentrations occur in the Sargasso Sea (2-40 mg/m^2). The chemical composition and possible sources of pelagic tar on Bermuda beaches and in the Sargasso Sea are discussed.

Reporting
Analysis

Citation Source: Biological Abstracts. 1974. 58(12) Entry #69251.

C-470-74
TECHNIQUES FOR ANALYSIS OF PARAFFIN HYDROCARBONS AND FOR INTERPRETATION OF DATA TO ASSESS OIL SPILL EFFECTS IN AQUATIC ORGANISMS

Clark, R. C., Jr., and J. S. Finley. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March 1973, Washington, D. C. 4172. p. 161-172.

The feasibility of using aquatic organisms which originally contained biogenic n-paraffin hydrocarbons as indicators of petroleum pollution is reported. The analytical techniques used to isolate and identify n-paraffin hydrocarbons from plant, animal, petroleum and sediment samples are described.

Analysis

Citation Source: Chemical Abstracts. 1974. 81(22). Entry #138249s.

C-471-74
THE SEARCH FOR CLEAN AIR

Duskin, K. 1973-1974 winter.
Quest 11(2):22-23.

The article describes the work conducted on a 22 day voyage of the German oceanic vessel "Meteor." Types and concentrations of hydrocarbons in the air and in certain Atlantic Ocean and Sargasso Sea surface waters were measured and removal mechanisms of natural hydrocarbons were studied.

Cleanup and recovery

Citation Source: Oceanic Abstracts. 1974. 11(6). Entry #74-05622.

C-472-74
IDENTIFICATION OF OIL POLLUTANTS: A REVIEW OF SOME RECENT METHODS

Gruenfeld, M. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 179-193.

Passive tagging of oils can be done using indices such as vanadium, nickel, sulfur and nitrogen content, gas chromatographic profile appearance, and carbon and sulfur isotope ratios. These indices are determined using a wide spectrum of instruments and techniques.

Analysis

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q12999M.

C-473-74
DETECTION OF FLOATING OILS ON WATER [English Summary]

Hagiwara, K., T. Tanaka, Y. Murakami, K. Hiiro, and A. Hawahara. 1974.
Bunseki Kagaku 23(7):794-795.

An automatic device has been developed which detects the presence of floating oils as thin as a few microns by collecting the oils on a translucent polypropylene or polyvinyl chloride film and measuring the light absorbance for the polymer film with the oils.

Citation Source: Chemical Abstracts. 1974. 81(26). Entry #175773d.

C-474-74
HYDROCARBONS IN (AEROBIC) SEDIMENTS OF INLAND WATERS IN THE FEDERAL REPUBLIC OF GERMANY

Hellman, H., and M. Holeczek. 1974.
Deutsche Gewaesserkundliche Mitteilungen 18(4):96-100.

An attempt was made to determine the concentration and distribution of various hydrocarbons, particularly the paraffins, in sediments of German inland waters; and to compare them to that of petroleum products (fuel oil, lubrication oils).

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1975. 4(11). Entry #4Q11214F.

C-475-74
PROMPT DETECTION AND TRACING OF OILS AND OTHER DETRIMENTAL CHEMICALS IN THE ENVIRONMENT

Jeltes, R. 1974.
Water Research 8(11):977-987.

The author suggests the establishment of small environmental "first-aid" laboratories in the world for administering quick and effective assistance in the detection of oil or other toxic materials in water.

Citation Source: The Engineering Index Monthly. 1975. 13(1).
Entry #006863.

C-476-74
DEVELOPMENT OF A FLOATING OIL SLICK DETECTOR

Kriebel, A. R. 1973.
NTIS Report AD-777 023/3WP. 139 p.

The laboratory tests undertaken to develop a floating oil detector are described. The operation and limitations of the detector are given.

Citation Source: Environment Abstracts. 1974. 4(12). Entry
#12-74-10232.

C-477-74
C_1 - C_4 HYDROCARBONS IN THE NORTH AND SOUTH PACIFIC

Lamontagne, R. A., J. W. Swinnerton, and V. J. Linnenbon. 1974.
Tellus 26(1-3):71-77.

Low molecular weight hydrocarbons in surface waters of the North and South Pacific have been determined. Average concentrations and locations of the C_1 - C_4 hydrocarbons in these regions are given.

Analysis

Citation Source: Chemical Abstracts. 1974. 81(22). Entry
#138840c.

C-478-74
A TECHNIQUE FOR PREDICTING THE MOVEMENT OF OIL SPILLS IN NEW YORK HARBOR

Lissauer, I. M. 1974.
Final Report, No. CGR/DC-8/74, USCG-D-6-75. 59 p.

The following topics are reviewed in the report: New York Harbor experiments; factors determining the movement of oil spills; potential oil pollution sites--Upper New York Bay.

Citation Source: Government Reports Announcements. 1974. 7(25).
Entry # AD-786 627/OGA.

C-479-74
HYDROCARBON POLLUTION IN THE WATERS OF THE UPPER ADRIATIC

Majori, L., F. Petronio, and G. Nedoclan. 1973.
In: Proceedings of the 5th International Colloquium of Medical Oceanography, Messina, October 4-7, 1971. S. Genovese (editor), Messina, Italy. p. 449-473.

Data are presented on superficial and residual oil determinations in the Gulf of Trieste. Widespread pollution was detected with pollution reaching high values in limited areas.

Analysis

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1974.
4(9). Entry #4Q9599M.

C-480-74
MEASUREMENT OF HYDROCARBONS IN WATER: APPLICATION TO CASES OF SURFACE WATER POLLUTION

Mallevialle, J. 1974.
Water Research 8(12):1071-1075.

The aim of the author was to observe changes in the amount of hydrocarbons in a river, upstream and downstream from an industrial estate. It was concluded that hydrocarbons in water can be measured by extraction with carbon tetrachloride,fluorisil chromatography and measurement of absorption over the 3000-2800 cm^{-1} infrared range.

Analysis

Citation Source: Citation Journal.

C-481-74
OIL-ON-WATER SENSOR

McCormack, K., G. Fournier, and W. Knight. 1975.
Contract DPT-CG-31888-A, AD-784104; TI-UI-998200-01-F; USCG-D-87-74.
NTIS Report CSCL 17/5. 206 p.

This final report describes the prototype equipment, construction and development of the Oil-on-Water Sensor, a system which detects the presence of oil on water by emitting a wideband IR impulse and receiving reflection at two narrow spectral bands.

Design and Engineering

Citation Source: Scientific and Technical Aerospace Reports. 1975.
13(2). Entry #N75-11454.

C-482-74
DISTRIBUTION OF HYDROCARBON-OXIDIZING MICROORGANISMS IN SOME SEAS

Mironov, O. G. 1973.
In: Proceedings of the 5th International Colloquium of Medical Oceanography, Messina, October 4-7, 1971. S. Genovese (editor), Messina, Italy. p. 315-324.

The paper focuses on the relationship between the presence of hydrocarbon-utilizing microorganisms in the oceans and the pollution of the sea by oil. The role of hydrocarbon-oxidizing bacteria as indicators of oil pollution is considered.

Biological degradation

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(9). Entry #4Q9598M.

C-483-74
OIL SPILL SURVEILLANCE SYSTEM STUDY

Mohr, D., K. McCormack, G. Brewster, and G. Fournier. 1973.
Environmental Protection Agency, Technology Series, Report EPA-R2-73-215. GPO Sup. Doc. EP1.23/2:73-215. 215 p.

Studies testing the ability of active and passive infrared sensor systems to detect petroleum on water were conducted. A combination of the two systems is recommended as an effective oil detection-monitoring device, since the active sensor provides absolute oil spill detection for ranges to 300 feet, and the passive sensor determines oil volume, areal coverage and probable oil detection for ranges to 1000 ft.

Remote Sensing

Citation Source: Selected Water Resources Abstracts. 1975. 8(1). Entry #W75-00007.

C-484-74
A PORTABLE GAS CHROMATOGRAPHIC TECHNIQUE TO MEASURE DISSOLVED HYDROCARBONS IN SEAWATER

Perras, J. C. 1973.
Final Report, No. USCG-D-2-75, CGR/DC-10/74. Contract DOT-CG-21660-A-3.
53 p.

The project's objective was to develop an automated portable gas chromatographic technique useful aboard small vessels to detect the presence of dissolved hydrocarbons in seawater and measure their concentrations. A summary of progress in the development of the apparatus is presented.

Design and engineering

Citation Source: Government Reports Announcements. 1974. 7(25). Entry #AD-786 583/5GA.

C-485-74
ULTRASONIC TECHNIQUES TO MEASURE WATER POLLUTANTS

Seklon, K. S., and R. C. Binder. 1973.
Proceedings of 2nd Joint Conference on Sensing of Environmental Pollutants, Washington, D. C. p. 177-184.

Ultrasonic velocity and absorption of sound were measured to determine the extent of pollution in fresh and seawater by crude oil, diesel oil and Cl solution. The sonic velocity, velocity gradient with respect to pollutant temperature, velocity gradient with respect to pollutant concentration, and percent attenuation were used in the determinations.

Citation Source: Chemical Abstracts. 1974. 81(24). Entry #138426a.

C-486-74
OCEANIC DISTRIBUTION OF LOW-MOLECULAR-WEIGHT HYDROCARBONS

Swinnerton, J. W., and R. A. Lamontagne. 1974.
Environmental Science & Technology 8(7):657-663.

Data are provided on the concentration and distribution of low-molecular-weight hydrocarbons in surface waters of the Gulf of Mexico, Caribbean Sea, Atlantic and Pacific oceans and other seas.

Citation Source: Environment Abstracts. 1974. 4(12).
Entry #12-74-10213.

C-487-74
INFRARED OIL FILM MONITOR

Wright & Wright, Inc. 1975.
Marine Technology Society Journal 9(1):22-24.

The design and operation of the infrared oil film monitor are described. The instrument consists of a transmitter which projects a light beam to the water surface, and a receiver, which analyzes the reflected infrared light from the water's surface. An alarm is activated when oil is detected.

Design and engineering

Citation Source: Wright & Wright, Inc., Environmental Engineers,
16 Braeland Ave., Newton Centre, Massachusetts
02159.

3. REMOTE SENSING

C-488-74
VOLUMETRIC DETERMINATION OF MARINE OIL SPILLS USING COORDINATED AIRBORNE AND SURFACE SAMPLING DATA

Estes, J. E., P. G. Mikolaj, R. R. Thaman, and L. W. Senger. 1973. Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 117-125.

"Methods and equipment are described which are used to obtain ground truth data on oil slick thickness, and techniques for interpreting these data by means of remotely sensed imagery. The method is applied to at-sea tests of an oil containment barrier."

Containment

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q12995M.

C-489-74
THE DEVELOPMENT OF AN EXPERIMENTAL AIRBORNE LASER OIL SPILL REMOTE SENSING SYSTEM

Fantasia, J. F., and H. C. Ingrao. 1973. Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 101-115.

Laser stimulated oil fluorescence is used as a technique for remote detection and coarse oil classification of oil spills. Quantification is possible under certain conditions.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13141M.

C-490-74
DEVELOPMENT OF U.S. COAST GUARD PROTOTYPE AIRBORNE OIL SURVEILLANCE SYSTEM

Ketchel, R. J., and A. T. Edgerton. 1973. Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 127-137.

Multispectral sensors, operating from the UV to the microwave region of the electromagnetic spectrum, will form a system for day/night all-weather airborne monitoring of oil spills at sea. Aerojet Electrosystems Company is the designer of the system.

Design and engineering

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13142.

C-491-74

POLARIZATION: A KEY TO AN AIRBORNE OPTICAL SYSTEM FOR THE DETECTION OF OIL ON WATER

Millard, J. P., and J. C. Arvesen. 1973.
Science 180:1170-1171.

"Skylight polarization, varying with the sun's position in the sky, influences the contrast of oil on water. Good contrast is most consistently obtained by viewing in azimuth directions toward or away from the sun, and the contrast is enhanced by imaging selected polarization components and by taking the difference between orthogonal polarization components."

Monitoring

Citation Source: Citation Journal.

C-492-74

ARIAL (sic) DETECTION OF SPILL SOURCES

Rudder, C. L., A. G. Wallace, and C. J. Reinheimer. 1973.
U.S. Environmental Protection Agency, Office of Research and Monitoring. Environmental Protection Technology Series EPA-R2-73-289. 32 p.

Aerial photographs of oil refineries are included in an imagery interpretation key of the petroleum industry, developed in conjunction with an aerial surveillance spill prevention system. Potential spill sources, as related to processing systems, product storage, and disposition of by-products are identified.

Citation Source: Pollution Abstracts. 1975. 6(1).
Entry #75-00465.

4. SAMPLING

C-493-74
EVAPORATION OF BOAT DEPLOYABLE THIN FILM OIL SAMPLERS

Chang, W. J., and W. A. Saner. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper,
Houston, Texas, May 6-8, 1974. 1:577-583. Paper 1996.

A series of tests were made evaluating the operation and efficiency of sorbent oil samplers. Gas chromatography, ultraviolet fluorescence and infrared spectrophotometry were techniques used to assess the sampler's ability to maintain the chemical integrity of three different oils tested.

Analysis

Citation Source: The Engineering Index Monthly. 1974. 12(11).
Entry #074493.

C-494-74
TAR POLLUTION SURVEY AT GOLDEN BEACH, FLORIDA

Curtis, M., and W. Saner. 1974.
Final Report, No. CGR/DC-14/74, USCG-D-3-75. 38 p.

A study, which focused on ambient levels of tar pollution of a beach area on the Southeast Florida coast, evaluated the effect of sampling zones of various sizes, and determined the effect of tar buildup on the beach with time, and the effect of wind on tar deposition.

General effects of oil pollution

Citation Source: Government Reports Announcements. 1974. 7(25).
Entry #AD-786 632/OGA.

5. ANALYSIS

C-495-74
A METHOD FOR THE SEPARATION OF OIL FROM AN AQUEOUS OIL-DETERGENT SOLUTION PRIOR TO IR ANALYSIS

Adams, C. E. 1974.
Final Report, No. NOLTR-74-102. 15 p.

A procedure is described which allows for the analysis of oil-in-water solutions in the presence of dissolved detergents, using the CCl_4 extraction-IR spectrophotometric method. In a previous test, the procedure effectively removed all the detergent in solution, leaving a CCl_4-oil solution for analysis.

Citation Source: Government Reports Announcements. 1974. 7(25).
Entry #AD-786 703/9GA.

C-496-74
SAMPLING ERRORS IN THE QUANTIFICATION OF PETROLEUM IN BOSTON HARBOR WATER

Ahmed, S. M., M. D. Beasley, A. C. Efromsen, and R. A. Hites. 1974.
Analytical Chemistry 46(12):1858-1860.

The article describes the results of tests measuring the precision and accuracy of sampling methods for determining petroleum amounts discharged into large bodies of water. The oil recovery by CCl_4 sampling was 100%, whereas the oil recovery by the foam adsorption method was much less.

Sampling

Citation Source: Chemical Abstracts. 1974. 81(22). Entry #140616c.

C-497-74
SOLUBILIZATION OF HYDROCARBONS BY THE DISSOLVED ORGANIC MATTER IN THE SEA

Boehm, P. D., and J. G. Quinn. 1973.
Geochimica et Cosmochimica Acta 37(11):2459-2477.

Analyses were conducted which determined the ability of water samples from Narragansett Bay and Providence River, and fulvic acid/saline water solutions to solubilize n-alkane, pristane and aromatic hydrocarbons and dibutyl phthalate. The results of the experiments are presented.

Citation Source: Selected Water Resources Abstracts. 1974.
7(24). Entry # W74-13166.

C-498-74
DISTRIBUTION OF HEAVY HYDROCARBONS IN SOME ATLANTIC OCEAN WATERS

Brown, R. A., T. D. Searl, J. J. Elliot, and B. C. Phillips. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 2172. p. 505-519.

Four hundred water samples were collected from two well traveled tanker routes (U.S. Gulf Coast to East Coast and Caribbean to East Coast) at a depth of 10 m and at the surface. Each sample was analyzed for hydrocarbon content, and it was found that nonvolatile hydrocarbons were present in the concentration range of 0.001 to 0.012 ppm weight. Sampling and analysis methods are described.

Sampling

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q12187M.

C-499-74
CONTACT (OIL) WATER DETERMINATION IN TERRESTRIAL WATERS USING AN OCEANOGRAPHIC METHOD

Buljan, M. 1974.
Acta Adriatica 15(4):1-19.

The paper describes a method for discriminating between contact water (waters containing natural petroleum) and natural waters. The technique involves the finding of two properties: sulfate balance and the index of aeration.

Citation Source: Biological Abstracts. 1974. 58(11). Entry #60021.

C-500-74
DETERMINATION USING MODERN METHODS OF IMPURITIES POLLUTING THE WASTE WATERS FROM PETROLEUM REFINERIES [English Translation]

Chernatskaya, A. N. 1974.
Khimiya Tekhnologiya Topliv i Masel 9:24-25.

"A review is given discussing methods and apparatus for determining the title impurities."

Citation Source: Chemical Abstracts. 1975. 82(6). Entry #34738e.

C-501-74
COMPARATIVE IDENTIFICATION OF OIL SPILLS BY FLUORESCENCE SPECTROSCOPY FINGERPRINTING

Coakley, W. A. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 215-222.

A simple method has been developed for the comparative identification of oil spills with suspect source oils using fluorescence spectroscopy fingerprinting. An explanation of the technique is given.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13001G.

C-502-74
MICRODETERMINATION OF GASOLINE IN POTABLE WATERS BY GAS CHROMATOGRAPHY

Dell'Acqua, R., and B. Bush. 1973.
International Journal of Environmental Analytical Chemistry 3(2):141-146.

The analytical method to identify and quantitatively determine levels of gasoline in potable water is described.

Citation Source: Pollution Abstracts. 1975. 6(1).
Entry #75-00317.

C-503-74
CORRELATION OF PHASE INVERSION WITH STABILITY OF OIL-IN-WATER EMULSIONS STABILIZED BY (POLYOXYETHYLENE)$_4$ CETYL ETHER

Enever, R. P. 1974.
Journal of Pharmacy and Pharmacology 26 (Supplement):128p-129p.

The paper examines the correlation between the phase inversion temperatures of oil-in-water emulsions and the emulsion stability, assessed by measurement of globule coalescence rates.

Citation Source: Citation Journal.

C-504-74
SOME PROBLEMS ASSOCIATED WITH THE COLLECTION OF MARINE SAMPLES AND ANALYSIS OF HYDROCARBONS

Farrington, J. W. 1974.
NTIS Report AD-777 695/8WP. 24 p.

The author discusses the problems associated with collecting and analyzing hydrocarbon samples under contaminant-free conditions and the use of accurate techniques used in other laboratories.

Sampling

Citation Source: Environment Abstracts. 1974. 4(12)
Entry: 12-74-10237.

C-505-74

HYDROCARBONS IN SPRING WATERS. OIL POLLUTION OR NATURAL SUBSTANCES

Hellmann, H. 1974.
Tenside Detergents 11(4):197-201.

Gas chromatographic and IR-spectrosopic analyses of hydrocarbons in spring waters indicated seasonal changes in the concentrations of straight chain and branched C_{14-38} paraffins. The hydrocarbons were mainly of biogenous origin.

Monitoring

Citation Source: Chemical Abstracts. 1975. 82(6). Entry #34781p.

C-506-74

DISCRIMINATION OF WASTE OILS BY MICRO-EMISSION SPECTROCHEMICAL ANALYSIS

Johnson, J. D., and H. R. Gram. 1974.
Final Report, Phase 1, No. 0236 USCG-D-21-75, Contract DOT-CG-33-185. 57 p.

A micro-emission spectrochemical technique has been developed which is able to discriminate waste oil from unused oil products recovered from the surface of navigable waters, by determination of the metal content of the oil. Tests were conducted on oil samples exposed to seawater and river water extractions in the laboratory and also on oil samples naturally weathered on the surface of brackish tidal water from an estuary.

Citation Source: Government Reports Announcements. 1974. 7(26).
Entry #AD-787 717/8GA.

C-507-74

AN ANALYSIS OF OIL OUTFLOWS DUE TO TANKER ACCIDENTS 1971-1972

Jones, E. L. 1973.
Final Report, No. USCG-D-81-74, Contract DOT-CG-31445-A. 169 p.

An analysis of the estimated oil outflow resulting from 1587 reported tanker casualties occurring in 1971-1972 is presented. Results of the analysis are compared to results of studies of oil tanker casualties occurring in the 1969-1970 period.

Reporting

Citation Source: Government Reports Announcements. 1974. 75(15). Entry #AD-780 315/8GA.

C-508-74
APPLICATION OF THE CONCEPT OF BIFURCATES PLUME TO SOME OIL POLLUTION PROBLEMS IN THE STRAIT OF GEORGIA

Khandekar, M. L., and T. S. Murty. 1973.
In: Proceedings of Canadian Society for Civil Engineering, 1st Canadian Hydraulics Conference, Alberta University, Edmonton, May 10-11, 1973. Alberta University Water Resources Center Publication No. 4:273-286.

Analyses were conducted to determine the effect of stratification on the spread of oil leaking from a grounded ship in three areas in the Strait of Georgia. Studies were made under a range of tidal and wind generated current conditions, using various densities of crude oils as well as analyzing different leakage rates.

Physical changes of oil in the environment

Citation Source: Selected Water Resources Abstracts. 1974. 7(23). Entry # W74-12100.

C-509-74
MINERAL OIL LOADING OF LAKE OF CONSTANCE SEDIMENTS

Koelle, W. 1974.
Kernforschungszentrum Karlsruhe (Berlin), KFK 1969 UF, 8-16.

Hydrocarbons of biological and mineral oil origin were distinguished with a ^{14}C technique. Biological hydrocarbons increase near the shore, whereas mineral oil hydrocarbons are distributed uniformly.

Citation Source: Chemical Abstracts. 1975. 82(3). Entry #47441c.

C-510-74
ALKANES AT THE AIR-SEA INTERFACE FROM OFFSHORE LOUISIANA AND FLORIDA

Ledet, E. J., and J. L. Laseter. 1974.
Science 186(4160):261-263.

Alkanes at the air-sea interface were analyzed in samples collected from three areas located off Louisiana and Florida. From the gas chromatographic and mass spectrometric analyses, it was suggested that such alkanes are entering the marine environment from a wide variety of biological sources as well as from natural seepage and man's activities.

Citation Source: Citation Journal.

C-511-74
WATER-SOLUBLE HYDROCARBONS FROM CRUDE OIL

Lee, C. C., et al. 1974.
Bulletin of Environmental Contamination & Toxicology 12(2):212-217.

A study was initiated which examined the properties and amounts of water-soluble materials that are derived from crude oils and which continue to have an impact on the environment after petroleum spills are cleaned up. It was found that hydrocarbon compositions in different oils are distinct and serve as an aid in identifying the original oil.

Citation Source: Environment Abstracts. 1974. 4(12).
Entry #19-74-10461.

C-512-74
HYDROCARBONS IDENTIFIED IN EXTRACTS FROM ESTUARINE WATER ACCOMMODATED NO. 2 FUEL OIL BY GAS CHROMATOGRAPHY-MASS SPECTROMETRY

Lewis, B. W., A. L. Walker, and R. H. Bieri. 1974.
NASA-TM-X-72009, NTIS Report CSCL 07D. 12 p.

The analytical method and results of a gas chromatograph-mass spectrometer analysis of methylene chloride and n-heptane extracts of a No. 2 fuel oil accommodated estuarine water sample are described.

Citation Source: Scientific and Technical Aerospace Reports.
1974. 12(22). Entry #N74-32580.

C-513-74
DEVELOPMENT OF METHODOLOGY AND APPARATUS FOR THE BIOASSAY OF OIL

Lichatowich, J. A., P. W. O'Keefe, J. A. Strand, and W. L. Templeton. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 659-666,

A summary is given of the techniques that may be applied in the bioassay of oil and other non-miscible substances. Several procedures, including the inability to maintain oil and water in a homogenous mixture within a test system, are discussed.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13025G.

C-514-74
MARINE POLLUTION BY HYDROCARBONS (HC) IN THE NORTHERN ADRIATIC SEA

Majori, L., F. Petronio, G. Nedoclan,and A. Bombieri. 1973.
Revue Internationale d'Oceanographie Medicale CERBOM 31-32, p. 137-169.

A method developed by the authors for measuring marine surface pollution by persistent hydrocarbons is described. Results obtained using the method in the Gulf of Trieste indicate that surface pollution by hydrocarbons depends more on space than time.

Monitoring

Citation Source: Aquatic Science & Fisheries Abstracts. 1974.
4(10). Entry #4Q10745M.

C-515-74
HYDROCARBON COMPONENTS OF FLOATING OIL POLLUTANTS OF SEAWATER

Matsui, M., K. Watanabe, T. Yoshida, and T. Kawabata. 1974.
Bulletin of the Japanese Society of Scientific Fisheries 40(1): 111-116.

Research was initiated to analyze components of hydrocarbon pollution in relation to the source and formation of tar balls floating on the seawater surface, which often cause serious damage to coastal Japanese fisheries. Experiments examining heavy oil, wasted lubricant, Iranian, Arabian, and Minas crude oil are described.

Citation Source: Aquatic Science & Fisheries Abstracts. 1974.
4(10). Entry #4Q10734M.

C-516-74
CHEMICAL AND PHYSICAL CHARACTERIZATION OF TAR SAMPLES FROM THE MARINE ENVIRONMENT

Mommessin, P. R., and J. C. Raia. 1974.
Final Report, No. S-14133 USCG-D-20-75, CGR/DC-25/74. Contract DOT-CG-23379-A. 210 p.

Tar samples recovered mainly from the Northwestern part of the Atlantic Ocean and along the eastern coast of the United States were analyzed and 32 physical and chemical characteristics were carefully measured in each sample. Two distinct types of tars were indicated: one derived from urban and industrial wastes, and the other containing petroleum based materials which had been modified by marine weathering processes.

Citation Source: Government Reports Announcements. 1974.
7(26). Entry #AD-787 788/9GA.

C-517-74
PERSISTENT HYDROCARBON CONTENT OF THE SEA ALONG CERTAIN TANKER ROUTES - A PRELIMINARY REPORT

Monaghan, P. H., J. H. Seelinger, and R. A. Brown. 1973.
Tanker Conference, 18th Annual, Reprint Papers, Hilton Head Island, SC, May 7-9, 1973. p. 232-259.

Samplings and analyses are being made measuring hydrocarbons (of the heavier type found in what are called "persistent oils") from surface waters and waters at depths of 10 meters in the seas. Samples have been taken between Gulf of Mexico ports and New York, Caribbean ports and New York, and in the Mediterranean.

Sampling

Citation Source: The Engineering Index Monthly. 1974. 12(11).
Entry # 074490.

C-518-74
EXTRACTION SEPARATION OF PETROLEUMS INTO OILS, TARS AND ASPHALTS [English Translation]

Pozdnyshev, G. N., R. I. Mansurov, and R. M. Ruchkina. 1974.
Khimiya Tekhnologiya Topliv i Masel 10:54-56.

The Marcusson method plus extraction separation gave the overall hydrocarbon composition without loss of light fractions of petroleum.

Citation Source: Chemical Abstracts. 1975. 82(2). Entry #46059x.

C-519-74
A QUANTITATIVE SURVEY OF OILS AND TARS STRANDED ON GALVESTON ISLAND BEACHES

Ray, S. M., R. K. Oja, L. M. Jeffrey, and B. J. Presley. 1974.
Final Report, No. USCG-D-10-75, CGR/DC-7/74. Contract DOT-CG-23681. 87 p.

Tar or tar-like residues appearing on Galveston Island beaches were assessed for one year. Oil tar samples were periodically analyzed for hydrocarbon detection and measurement, nickel, vanadium, chromium, and cobalt, carbon 12/13 ratios, and minerals. Results indicated the tar appeared to be the result of man's activities.

Citation Source: Government Reports Announcements. 1974. 44(26). Entry #AD-787 718/6GA.

C-520-74
OIL SPILL CAUSED BY THE COUPLED EFFECTS OF WIND AND WAVES

Reisbig, R. L. 1973.
NTIS Report AD-777 702/2WP. 69 p.

An experiment was designed to evaluate the significance of coupled wind and wave effects on oil spill drift. Drift velocity results are reported for wind current and waves traveling in the same direction, in opposite direction and at fixed angles to each other.

Citation Source: Environment Abstracts. 1974. 4(12). Entry #12-74-10231.

C-521-74
REMOTE SAMPLER FOR DETERMINING RESIDUAL OIL CONTENT OF SURFACE WATER

Schatzberg, P., and D. F. Jackson. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 139-144.

The paper describes a simple, flow-through device with pump and skimmer for use in measuring the residual oil concentration of coastal and estuarine surface waters. The device contains a sorbent material which quantitatively removes oil from a moving water stream and permits extraction of the oil in a laboratory.

Cleanup and recovery

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q12996G.

C-522-74
MEASUREMENT OF EVAPORATION RATES FROM OIL SLICKS ON THE OPEN SEA

Sivadier, H. O., and P. G. Mikolaj. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 475-484.

The authors discuss a gas chromatographic procedure to determine the time dependent weight loss of an oil slick by following its compositional changes. Results from experiments using natural seep oil are described.

Chemical changes of oil in the environment

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13057M.

C-523-74
DROP SIZE DISTRIBUTION IN OIL WATER MIXTURES

Stokes, V. K., and A. C. Harvey. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 457-465.

Oil/water mixtures made by three different methods were used to aid in identifying parameters affecting drop size distribution. A standard procedure for making oil/water mixtures was adopted. Information on size distribution is important to the design of some separators.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13055G.

C-524-74
SOLUBILITY OF HIGHER-MOLECULAR-WEIGHT N-PARAFFINS IN DISTILLED WATER AND SEAWATER

Sutton, C., and J. A. Calder. 1974.
Environmental Science & Technology 7:654.

In solubility determinations of n-paraffins in distilled water and seawater, it was found that in all cases the compounds are less soluble in seawater. The salting-out effect observed in n-paraffins indicates the importance of estuaries in determining the transport and fate of n-paraffins and other organic molecules.

Citation Source: Environment Abstracts. 1974. 4(12).
Entry #12-74-10212.

C-525-74
DETERMINATION OF TRACE AMOUNTS OF DISPERSED OIL IN WASTE WATER BY SOLVENT EXTRACTION - INFRARED ANALYSIS

Suzuki, R., N. Yamaguchi, and R. Matsumoto. 1974.
Japan Analyst 23(11):1296-1300.

A method to determine trace amounts of dispersed oils in waste water has been developed. The oils in water are extracted with carbon tetrachloride and the concentration of mineral oil, fatty oil or fatty acid can be calculated by measuring the infrared absorption of the extract at 1900 to 1400 cm^{-1}.

Waste water treatment

Citation Source: Citation Journal.

C-526-74
CHARACTERISTICS OF NATURALLY OCCURRING AND POLLUTANT HYDROCARBONS IN MARINE SEDIMENTS

Tissier, M., and J. L. Oudin. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 205-214.

Chromatography, mass spectrometry and UV fluorescence analyses have been conducted on sediment samples from Normandie and Seine bays (English Channel) to discriminate between indigenous hydrocarbons and crude oil-derived hydrocarbons present in the samples. Characteristics of hydrocarbons from unpolluted and polluted sediment samples are presented.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13053M.

C-527-74
DETERMINATION OF HYDROCARBON SOLUBILITY IN SEAWATER AND THE ANALYSIS OF HYDROCARBONS IN WATER-EXTRACTS

Wasik, S. P., and R. L. Brown. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 223-227.

Hydrocarbon solubility in seawater was determined by gas chromatography, using the ratio of the solute peaks and the volume of the apparatus. Examination of a series of chromatograms obtained from a series of flushes can identify hydrocarbon groups and concentrations.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13002M.

C-528-74
HYDROCARBONS IN THE MARINE ECOSYSTEM

Whittle, K., P. R. Mackie, and R. Hardy. 1974.
South African Journal of Science 70(5):141-144.

The report describes analyses which were conducted on the aquatic ecosystem of the River Clyde to determine the presence of hydrocarbons.

Monitoring

Citation Source: Chemical Abstracts. 1975. 82(5). Entry #26730f.

C-529-74
LIMITATIONS TO LENGTH OF CONTAINED OIL SLICKS

Wilkinson, D. L. 1973.
American Society of Civil Engineering. Hydraulics Division
[HY 3 No. 10379]:492-494.

The study has shown that there is a limit to the volume of oil which may be contained in any current of finite depth. An expression describing the form of long oil slicks is derived and solved numerically.

Citation Source: Citation Journal.

C-530-74
THE TOXICITY TESTING OF OILS AND DISPERSANTS: A EUROPEAN VIEW

Wilson, K. W., E. B. Cowell, and L. R. Beynon. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 255-261.

A review is given of the European approaches to the purpose and problems of testing the toxicity of hydrocarbons and dispersants in both laboratory and field experiments.

General effects of oil pollution

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q130056.

C-531-74
A HIGHLY SENSITIVE TECHNIQUE FOR THE LIQUID CHROMATOGRAPHIC ANALYSIS OF PHENOLS AND OTHER ENVIRONMENTAL POLLUTANTS

Wolkoff, A. W., and R. H. Larose. 1974.
Journal of Chromatography 99(1974):731-743.

A highly sensitive technique for the analysis of phenols and other environmental pollutants by high-speed liquid chromatography using a cerium (IV) sulfate-fluorescence detection system is described.

Citation Source: Citation Journal.

C-532-74
PETROLEUM HYDROCARBONS IN NARRAGANSETT BAY: II. CHEMICAL AND ISOTOPIC ANALYSIS

Zafiriou, O. C. 1973.
Estuarine & Coastal Marine Science 1(1):81-87.

Analyses have shown that surface sediments of upper Narragansett Bay contain a complex mixture of hydrocarbons at over 10 times the levels of the lower Bay, and that petroleum is indicated as the major source of the hydrocarbons. Characteristics of the oils detected are presented.

Citation Source: Biological Abstracts. 1974. 58(11). Entry #60025.

B. OIL POLLUTION CONTROL

1. CONTAINMENT

C-533-74
OIL SPILL CONTAINMENT SYSTEM DEVELOPMENT AND TESTING PROGRAM

Abrahams, R. N., and E. R. Miller, Jr. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 361-374.

Development and testing of a high seas oil containment system by the U.S. Coast Guard are reviewed. Results of the testing include data on oil loss mechanisms and oil loss rates under both calm and high sea conditions.

Design and engineering

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13144M.

C-534-74
NEW CRITERION FOR PREDICTING HEADWAVE INSTABILITY OF AN OIL SLICK RETAINED BY A BARRIER

Agrawal, R. K., and L. A. Hale. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper, Houston, Texas, May 6-8, 1974. (1):461-466. Paper 1983.

A simple technique is presented for predicting the water current velocity which will initiate one failure mode in oil containment barriers (i.e. entrainment failure).

Citation Source: The Engineering Index Monthly. 1974. 12(11). Entry #071912.

C-535-74
FIRST PNEUMATIC BUBBLE BARRIER AGAINST THE SPREAD OF OIL ON WATER, INSTALLED IN THE NETHERLANDS

Anon. 1974.
Holland Shipbuilding 23(1):29.

A pneumatic bubble oil barrier has been installed by Atlas Copco Nederland BV, at the entrance of the Neckar harbor basin in Rotterdam. The 145 m long barrier can contain 30 tons of oil within the docks, and can be activated within 35 seconds after an oil spill alarm has sounded.

Cleanup and recovery

Citation Source: Environmental Health and Pollution Control. 1974. 6(4). Entry #1497.

C-536-74

"FLOATING-SUBMERGING" FENCE CONTAINS OIL SPILLS IN MINUTES

Anon. 1974.
Rubber World 170(4):70-71.

Fast and effective oil containment is achieved through the use of a floating-submerging oil fence developed by Bridgestone Tire Co., Ltd., Japan. The fence can be stored on the ocean bottom when not in use and then be floated into position in 18 to 30 minutes when needed. The apparatus is composed of a flexible rubber skirt supported by two air-filled hoses and extending above and below the water surface.

Citation Source: Citation Journal.

C-537-74

NEW OIL-SPILL BOOM ANNOUNCED

Anon. 1974.
Oil & Gas Journal 72(52):169.

The article describes the properties of a new oil-spill barrier which is capable of withstanding severe impact and constant abrasion.

Citation Source: Citation Journal.

C-538-74

NEW SIMULATED OIL-SPILL TEST TANK

Anon. 1975.
Oil & Gas Journal 73(8):90.

An environmental test tank has been developed by Houston Research, Inc., Houston, Texas, in which oil containment devices or systems may be tested. The tank is equipped with a wavemaker and a towing device to propel test devices at various speeds, so as to permit tests under completely reproducible environmental conditions.

Design and engineering

Citation Source: Citation Journal.

C-539-74

POLLUTION CONTROLS

Anon. 1974.
Offshore 34(13):144.

The operation of advanced design oil pollution control barriers, announced by Offshore Devices, Inc., is described. The apparatus is extremely strong and is able to move with the waves, maintaining an oil fence at all times on the high seas.

Design and engineering

Citation Source: Citation Journal.

C-540-74
SEABOOM HOLDS OIL SPILLS

Anon. 1974.
Mechanical Engineering 96(5):54-55.

The design and operation of an oil containment apparatus, the SEABOOM, developed by Submarine Engineering Associates, Cohasset, Massachusetts, are described. The boom has been providing protection against shore pollution in Salem Harbor and a part of Narragansett Bay, and the company is presently looking at the possibility of installing SEABOOM units around offshore rigs and platforms to contain oil spills.

Design and engineering

Citation Source: Citation Journal.

C-541-74
LABORATORY AND FIELD TESTING OF SURFACE-FILM FORMING CHEMICALS
FOR USE AS OIL COLLECTING AGENTS

Barger, W. R. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 241-246.

Forty-seven chemicals capable of slowing the spread of oil or driving oil into a thicker layer were run through a series of screening tests based on physical properties and surface-chemical properties. The most useful chemicals can be employed with oil recovery equipment, which is more efficient in removing thicker oil layers.

Cleanup and recovery

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13004G.

C-542-74
STANDARDIZED HARDWARE FOR OIL SPILL CONTAINMENT BOOMS

Campbell, F. J. 1974.
Report No. CEL-TN-1343. 54 p.

The design, development and testing of standardized hardware to deploy Navy oil spill containment booms are reported. Equipment used consists of a boom connector, a towing assembly and a boom bulk-head attachment.

Citation Source: Government Reports Announcements. 1974.
74(18). Entry #AD-781 645/7GA.

C-543-74
DESIGN PARAMETER STUDY OF AN OIL SPILL BOOM

Chung, J. S., G. R. Cunningham, and J. M. Evon. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 427-439.

Design data are presented on the proper relationships between the size and shape of boom modules and waves. Pertinent characteristics include boom strength, net depth for a net-system boom and modular interaction.

Design and engineering

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13147G.

C-544-74
DEVELOPMENT OF HERMAPHRODITE BREAKWATER UNITS UTILIZING HYDROFOILS IN SPECIFIC ARRANGEMENTS

Frey, K. P. H. 1974.
Rhode Island University Marine Technical Report Series, No. 24.
Presented at Floating Breakwaters Conference, Newport, Rhode Island, April 23-25, 1974. p. 113-129.

The report investigated the advantages of using basic airfoil or hydrofoil research in the field of floating breakwaters. A hermaphrodite system, having a composite breakwater with a discontinuous surface and a unit of continuous surface, is recommended as an effective device for reducing the spread of pollution spills.

Citation Source: Selected Water Resources Abstracts. 1975. 8(1).
Entry # W75-00411.

C-545-74
CONTROL AND CONFINEMENT OF OIL POLLUTION ON WATER WITH MONOMOLECULAR SURFACE FILMS

Garrett, W. D., and W. R. Barger. 1972.
Memorandum Report 2451, June 1972. USCG 724110.1/4-1.

Several materials were examined for their ability to reduce the area covered by oil spilled on water. Such "collecting agents" maintain oil in a layer up to a maximum of one-half inch by preventing its spread over the water surface. The agents are useful in increasing the efficiency of oil recovery devices.

Citation Source: Selected Water Resources Abstracts. 1974.
7(22). Entry # W74-11781.

C-546-74
AN EFFECTIVE OIL SPILL CONTAINMENT-RECOVERY SYSTEM FOR HIGH SEAS USE

Glaeser, J. L. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 589-596.

Two unique aspects of this system are a barrier with 'bottom tension' to increase effectiveness and survival strength and a skimmer system using a droplet formation process to recover high viscosity emulsions. Results of the testing program and a typical operational boom and skimmer package are discussed.

Design and engineering
Cleanup and recovery

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13150M.

C-547-74
COAST GUARD OIL POLLUTION CONTROL SYSTEMS

Jordan, L., and L. K. Bragaw. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper, Houston, Texas, May 6-8, 1974. (1):549-558. Paper 1994.

The paper describes the U.S. Coast Guard's pollution control program, including its physical resources (Air Deliverable Anti-pollution Transfer System, High Seas Barrier, High Seas Recovery and Airborne Remote Sensing) and its human resources, composed of three Regional Strike teams responding to oil pollution incidents.

Cleanup and recovery
Remote sensing

Citation Source: The Engineering Index Monthly. 1974. 12(11). Entry #074494.

C-548-74
PHYSICAL REQUIREMENTS FOR OIL POLLUTION CONTROL BARRIERS

Milgram, J. H. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 345-381.

An oil pollution control barrier must be strong enough to endure heavy seas and to endure launching and recovery activities. The barrier must damp out relative oil height responses and have a low roll angle to prevent leakage over or under the barrier.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13145G.

C-549-74
MECHANICAL CONTROL OF OIL SPILLS UTILIZING A STREAMLINED BOOM

Wooten, D. C. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 383-389.

Described is a streamlined oil retention boom consisting of a hydrofoil followed by a rigid sump to collect oil during a 2 kt or greater current or while being towed.

Cleanup and recovery

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13146G.

2. CLEANUP AND RECOVERY

C-550-74
CLEAN SWEEP OIL RECOVERY EQUIPMENT

Anon.
Product Information.

A general description of the operational oil recovery rates, and the application of each of the oil recovery systems developed by Lockheed Missiles & Space Company is provided.

Information Source: C. Lindell, Lockheed Missiles & Space Co.,
Sunnyvale, California 94088.

C-551-74
INCINERATOR SHIP VULCANUS COMPLETES BURN

Anon. 1974.
Ocean Industry 9(12):49.

The German incinerator ship Vulcanus, under contract for Shell Chemical Co., was successful in burning 4,000 metric tons of hydrocarbon wastes between October 16 and October 28, 1974, in the Gulf of Mexico. No detectable change in seawater alkalinity and no visible evidence of environmental stress in the area were reported.

Citation Source: Citation Journal.

C-552-74
JOINT CANADA-UNITED STATES MARINE POLLUTION CONTINGENCY PLAN FOR SPILLS OF OIL AND OTHER NOXIOUS SUBSTANCES

Anon. 1974.
U.S. Coast Guard. 56 p.

The Joint Contingency Plan pertains to specific locations where oil pollution is a threat to both countries. The purpose of the plan is to provide a coordinated response to control and cleanup of spill incidents in designated areas by federal, state and regional plans of both parties.

Regulations, standards and planning

Citation Source: Government Reports Announcements. 1974.
74(20). Entry #AD-782 895/76A.

C-553-74
OIL ABSORBENT

Anon. 1974.
Offshore 34(13):138.

The article describes the use of Petro-Traps, a new petroleum and oily liquid absorbent developed by Dart Union Co. The absorbent absorbs oil while letting water pass through a rugged fiberglass membrane; the absorbed liquids can then be wrung from the trap allowing for reapplication.

Citation Source: Citation Journal.

C-554-74
OIL SKIMMER SERIES 7000

Anon.
Product Information.

The Series 7000 Oil Skimmer is an easily installed, economical means for removing or recovering floating oils in process waters or oil spills. Floating oils adhere to an endless belt and recovered oil can be discharged to a suitable container.

Information Source: F. W. Vitek, Met-Pro Systems, Inc., 5th St. and Mitchell Ave., Lansdale, Pennsylvania 19446.

C-555-74
OIL SORBENT MATERIALS

Anon.
Product Information.

Pertinent information including the properties, specifications, and operational instructions of each of the Conwed oil absorption materials are given. The products have a high rate of sorption, are able to pick up 15-22 times their weight in oil, and the materials are reusable.

Information Source: T. C. Edgren, Conwed Corp., 332 Minnesota St., St. Paul, Minnesota 55101.

C-556-74
OIL SPILL SPOILER

Anon. 1974.
Environmental Science & Technology 8(8):718.

An oil reclaiming system is described, composed of a diesel-powered jet-driven vessel with a continuous conveyor made of an open-celled foamed material which is lowered into the water. The belt traps oil of all types while allowing water to flow through freely.

Citation Source: Citation Journal.

C-557-74
RPC LIQUID/LIQUID SEPARATOR

Anon.
Product Information.

The literature describes the RPC Separator which is a coalescer capable of separating fine emulsions of immiscible liquids to as low as 1 ppm of the discontinuous phase.

Information Source: D. R. Whiteman, RPC Division, Midland-Ross Corporation, P.O. Box 490, Roxboro, North Carolina 27573.

C-558-74
SKIMMER PUMPING RATE ADJUSTABLE TO 300 GPH

Anon. 1974.
Oil & Gas Journal 72(48):120.

The Skimmer Float 200 is a unit which removes oil and other organic liquids from the water's surface. Design features of the skimmer enable it to minimize water intake and result in an oil removal efficiency of >95%.

Citation Source: Citation Journal.

C-559-74
SKIMMER FLOATS OIL OUT OF WATER

Anon. 1974.
Machine Design 46(17):47.

An oil skimmer, developed by Waukee Engineering Co., Milwaukee, Minnesota, operates by collecting and passing an oil-water mixture into a vertical tube. Oil, having a lower specific gravity than water, collects at the top of the tube while the water enters a tank compartment through an outlet in the lower tube.

Design and engineering

Citation Source: Citation Journal.

C-560-74
SOCIETY OF PETROLEUM ENGINEERS OF AIME: SECOND MIDWEST OIL AND GAS SYMPOSIUM

Anon. 1973.
In: Society of Petroleum Engineers of AIME. Preprints SPE 4870 and 4874.

Included in the symposium on aspects of pollution control and prevention in the petroleum industry are papers discussing contaminant removal and environmental controls in the Michigan oil industry.

Regulations, standards and planning

Citation Source: Pollution Abstracts. 1975. 6(1).
Entry #75-00936.

C-561-74
NEW DEVICE FOR REMOVING OIL SLICKS FROM THE SURFACE OF WATER

Asper, J. J., and P. Bolli. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 315-332.

The new device developed by Battelle, comprises a rotating, multi-thread screw in a casing which traps inflowing oil and water between the threads. The oil thickens as the pitch of the thread progressively diminishes and is removed from an end chamber by a pump. Water is removed through an opening below the screw casing.

Design and engineering

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13009G.

C-562-74
ENVIRONMENTAL CONSERVATION IN OFFSHORE PETROLEUM OPERATIONS

Barton, H. B. 1974.
Presented at 9th World Energy Conference, Detroit, September 22-27, 1974. p. 3.2-6. 22 p.

The oil industry, in its plans to substantially increase offshore petroleum activities by 1985, has also developed programs dealing with the development of (1) safety production equipment, (2) equipment for the containment and recovery of accidental oil spills, (3) the organization of groups to coordinate oil spill containment and cleanup, and (4) the funding of studies examining environmental factors affecting coastal ecosystems.

Research
Containment
Biological effects

Citation Source: Environment Abstracts. 1974. 4(11).
Entry #12-74-09649.

C-563-74
CHEMICAL ADDITIVES TO CONTROL OIL SPILLS - A STATE-OF-THE-ART SUMMARY

Bauer, W. H., and J. J. Bulloff. 1974.
Interim Technical Report, August-December, 1973, No. USCG-D-69-74, Contract DOT-CG-33755. 158 p.

"The report summarizes the state of the art of using chemical additives to improve the control of oil spills at increased current velocities of up to 10 knots. An extensive bibliography containing up to date work on oil slick behavior, spill containment and removal and modification of oil properties by additives are(sic) included."

Containment
Bibliography

Citation Source: Government Reports Announcements. 1974. 74(15).
Entry #AD-779 557/86A.

C-564-74
CLEAN GULF ASSOCIATES - THE ORGANIZATION AND CAPABILITIES OF AN OIL SPILL CLEANUP ASSOCIATION FOR THE GULF OF MEXICO

Berry, W. L. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper, Houston, Texas, May 6-8, 1974. (1):611-623. Paper 1999.

The organizational structure and equipment used by the Clean Gulf Associates, a group established by the petroleum operators in the Gulf of Mexico to provide for fast and effective cleanup of marine oil spills, are reviewed.

Citation Source: The Engineering Index Monthly. 1974. 12(11).
Entry #074499.

C-565-74
CLEANUP OF INLAND OIL SPILLS

Betts, W. E. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 549-558.

New devices, designed to meet the needs of inland oil spills have been developed and descriptions of the cleanup equipment are presented. Examples of successful cleanup of various inland oil spills are given.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13017F.

C-566-74
USE OF MASSACHUSETTS DIP OIL SKIMMER ON FREE SLICKS IN THE CASCO BAY (PORTLAND) SPILL

Bianchi, R. A., E. E. Johanson, and J. H. Farrell. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 643-655.

The report discusses the use of the Massachusetts' newly developed Dynamic Inclined Plane (DIP) Skimmer in the cleanup operations of a 100,000 gallon oil spill in Casco Bay from a ruptured tank on the tanker Tamano. Evidence for the need for and effectiveness of a mobile skimmer in large oil spill situations is presented.

Design and engineering

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13024M.

C-567-74
SEA TRIALS OF A HIGH-SEAS OIL RECOVERY SYSTEM

Blockwick, T. N. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper, Houston, Texas, May 6-8, 1974. (1):577-583. Paper 1996.

The design and operation of a 2000 gallon/minute oil recovery system developed by Ocean Systems, Inc. are described. Results of at-sea tests of the oil recovery system are given.

Design and engineering

Citation Source: The Engineering Index Monthly. 1974. 12(11). Entry #074496.

C-568-74
AIR FLOTATION ANSWERS AIRPORT'S NEEDS

Brune, D. N. 1974.
Water Wastes Engineering 11(8):22-24,26.

The article describes how Dallas-Fort Worth regional airport deals with the problem of the flow of large amounts of petroleum products in its collection system.

Citation Source: The Engineering Index Monthly. 1974. 12(11). Entry #074488.

C-569-74
DEVELOPMENT OF THE 'NEXT GENERATION' CHEMICAL DISPERSANTS

Canevari, G. P. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 231-240.

The current status of chemical oil spill dispersant development is reviewed, and the beneficial aspects and limitations of the dispersants are illustrated. A discussion of 'next generation' oil spill dispersants is given, listing major improvements over conventional systems.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13003G.

C-570-74
QUANTITATIVE EVALUATION OF MECHANICAL OIL SPILL CLEANUP DEVICES

Der, J. J., and D. J. Graham. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 627-633.

A quantitative method has been devised for the preliminary screening and, with the availability of more accurate performance data, final evaluation of oil removal devices. Oil recovery systems highly rated by the systematic method are presented.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13022G.

C-571-74

SORBENT SYSTEM DEVELOPMENT FOR OIL SPILL CLEANUP

Dorrler, J. S. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 309-314.

Five research projects, contracted by the Environmental Protection Agency, were conducted to develop efficient unit operations for the removal of oil with the aid of sorbent materials. Results of the research efforts indicated the mechanical sorbent systems are effective in recovering spilled oil with a 90% recovery efficiency. Each of the five-unit operations developed is evaluated.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13008G.

C-572-74

ANALYTICAL EXAMINATION OF OIL/WATER SEPARATION BY COALESCENCE

Finger, S. M., and T. S. Yu. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 403-408.

The usefulness of the oil/water separation process of coalescence was studied using a three-stage prototype separation system of which coalescence was the final stage. The data indicated that increasing oil and suspendible solids concentration decreased coalescer element lifetime, although above a certain level increasing oil concentration had no effect. It was concluded that coalescence is useful as a final step in an oil/water separation system.

Waste water treatment

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q1314G.

C-573-74

ENGINEERING STUDY OF AN OIL GELLATION TECHNIQUE TO CONTROL SPILLS FROM DISTRESSED TANKERS

Goldstein, A. M., R. M. Koros, and B. L. Tarmy. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 247-253.

Data on the effect of mixing energy, mixing time, gellation time, and temperature on gel strength were generated in the study.

A test with crude oil is described. The gel would float as a coherent mass if oil escaped from a damaged ship.

Design and engineering

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13143M.

C-574-74
CATION-ACTIVE DEMULSIFIERS FROM FATTY ACIDS [English Translation]

Gorodnov, V. P., and A. A. Petrov. 1974.
Khimiya Tekhnologiya Topliv i Masel 5:20-22.

The preparation and description of two emulsifiers which are most effective in demulsifying a one-ton crude oil-in-water emulsion are presented.

Citation Source: Chemical Abstracts. 1974. 81(22). Entry #137846x.

C-575-74
WATERBORNE DEBRIS IN MARINE POLLUTION INCIDENTS

Hancock, J. A., R. P. Jacobs, M. R. Knapp, and J. S. Glasgow. 1974.
Final Report, No. USCG-D-108-74, Contract DOT-CG-23223-A. 465 p.

The problems arising from the presence of floating debris hindering the cleanup of spilled fluids, such as oil spills, are discussed. The types of waterborne debris found in coastal, harbor and estuarine areas are described and the effects of debris on pollution response equipment are given.

Citation Source: Government Reports Announcements. 1974. 7(25).
Entry # AD-786 568/6GA.

C-576-74
CASE STUDIES OF THE USN SUPERVISOR OF SALVAGE, SALVAGE RELATED OIL POLLUTION INCIDENTS

Irons, D. E. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 597-600.

Discussed are 6 cases describing the involvement of navy salvage forces in oil pollution control, prevention and cleanup of spills produced by ship collisions, groundings and overboard discharge. Methods and equipment used to combat the oil spills are given.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q1319G.

C-577-74

TWO TYPES OF OIL SPILLS IN SWEDISH INLAND WATERS - TESTS OF NEW MATERIALS, IDEAS AND METHODS

Jerbo, A. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 559-567.

The paper describes Sweden's success in combating oil spills into its ponds and rivers through the development of a new oil adsorption material, adsorbent blower, booms, incinerators and techniques.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13017F.

C-578-74

DESIGN, DEVELOPMENT, TEST, AND EVALUATION OF AN OPEN OCEAN OIL RECOVERY SYSTEM FOR USE IN WAVES

Johanson, E. E., R. A. Bianchi, and J. H. Farrell. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper, Houston, Texas, May 6-8, 1974. (1):559-576. Paper 1995.

A program was established by JFB Scientific to design, build and test an open sea oil recovery system for high wave conditions. Past massive spills were studied to establish operational requirements for the unit. The first system was built for the U.S. Navy Supervisor of Salvage and tested in April, 1974.

Design and engineering

Citation Source: The Engineering Index Monthly. 1974. 12(11). Entry #074495.

C-579-74

LAKE CHAMPLAIN: A CASE HISTORY ON THE CLEANUP OF #6 FUEL OIL THROUGH 5 FEET OF SOLID ICE AT NEAR-ZERO TEMPERATURES

Lamp'l, H. J. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 579-582.

Adverse weather conditions at the time of this major spill required improvisation by the personnel involved. New ideas and techniques were needed to remove the oil and contain the oil to prevent further pollution.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13148F.

C-580-74
OIL RECOVERY ON THE HIGH SEAS

Leigh, J. T. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 351-360.

Two prototype oil recovery systems are currently being developed to meet the following design goals: air transportability, recovery of a complete range of oil types at 2000 gpm, and use with existing Coast Guard oil recovery equipment and facilities. The construction, design and efficiency of each system are described.

Design and engineering

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13012M.

C-581-74
DEVELOPMENT OF A NOVEL HIGH VELOCITY OIL SLICK SKIMMER

Lindenmuth, W. T. 1974.
Final Report, No. TR-7411-1, USCG-D-19-75, Contract DOT-CG-41058-A. 46 p.

A new device called a Surface Velocity Retarder Oil Skimmer has been shown to be able to recover thin oil slicks in currents of up to 10 fps. The design and operation of the device, and results of tests measuring its performance are described.

Citation Source: Government Reports Announcements. 1974. 7(25). Entry # AD-786 880/5GA.

C-582-74
TREATMENT OF HAZARDOUS MATERIAL SPILLS WITH FLOATING MASS TRANSFER MEDIA

Mercer, B. W., et al. 1973.
EPA Environmental Protection Technology Series Report EPA-670/2-73-078, USGPO. 102 p.

In the report, which discusses an approach for in situ treatment of hazardous polluting spills for a static body of water, highly effective removal agents were cited. A commercial lightweight activated carbon was found to be very effective for recovering organic materials such as phenol, aromatic hydrocarbons, and organophosphorous insecticides from water.

Citation Source: Environment Abstracts. 1975. 5(1). Entry #19-75-00921.

C-583-74
CONCEPT DEVELOPMENT OF A FREE VORTEX OIL RECOVERY SYSTEM

Nebeker, E. B., and S. E. Rodriguez. 1973.
NTIS Report AD-777 024/1WP.

The operating effectiveness of a free vortex oil skimming system in the open seas was tested and the results are described. The system was tested in its ability to recover oil of various film thicknesses in stationary and severe seas.

Citation Source: Environment Abstracts. 1974. 4(12).
Entry #12-74-10229.

C-584-74
FREE VORTEX RECOVERY OF FLOATING OIL

Nebeker, E. B., S. E. Rodriguez, and P. G. Mikolaj. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 333-338.

A description of the operation and performance of a technique using a free vortex to recover oil from ocean, stream and harbor waters is given.

Design and engineering

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q1310G.

C-585-74
THE ELECTRICAL PROCESS IN THE BREAKING OF DILUTE OIL-IN-WATER EMULSIONS

Orr, C., Jr., and E. Y. H. Keng. 1974.
Georgia Environmental Resources Center, Atlanta, Report No. ERC-0674. NTIS Report #PB-235 908. 15 p.

The study evaluates the usefulness of electrical measurements, particularly the "zeta potential," in determining what chemicals and application rates are effective in treatment processes to break oil-in-water emulsions.

Waste water treatment

Citation Source: Selected Water Resources Abstracts. 1974.
7(23). Entry # W74-12343.

C-586-74
DEVELOPMENT OF A POLYURETHANE FOAM MARINE OIL RECOVERY SYSTEM

Oxenham,J. P., R. A. Cochran, D. P. Hemphill, P. R. Scott, and
J. P. Fraser. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil
Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 277-289.

Recycled polyurethane foam, foamed on the site of an oil spill, is used to recover oil. With the use of collection booms, a chainlink belt for gathering oil-soaked foam and a roller-wringer, the oil is recovered and separated from the foam.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13011M.

C-587-74
FREE VORTEX APPROACH TO RECOVERY OF FLOATING OIL

Rodriguez, S. E., E. B. Nebeker, J. F. Leary. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper,
Houston, Texas, May 6-8, 1974. (1):601-609. Paper 1998.

The development and testing of the free-vortex approach to floating oil recovery are discussed. The system operates through surface inflow that gathers oil and a central vortex that concentrates the oil for removal. Tests indicated the technique to be capable of operation under high seas conditions.

Design and engineering

Citation Source: The Engineering Index Monthly. 1974. 12(11).
Entry #074498.

C-588-74
DETERMINATION OF THE DEMULSIFYING CAPACITY OF A WATER-AND-OIL
PETROLEUM EMULSION [English Summary]

Rucevic, B., R. Ljubic, and B. Atijas. 1974.
Nafta (Zagreb) 25(2):63-68.

"A cylinder test is described for determination of the demulsifying capacity of the surfactants independently of their ionic composition and solubility in various stages of emulsion."

Citation Source: Chemical Abstracts. 1974. 81(26). Entry #172579j.

C-589-74
TESTING THE LOCKHEED DISC-DRUM ROUGH WATER OIL RECOVERY SYSTEM

Scharfenstein, C. F., and J. F. Leary. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper,
Houston, Texas, May 6-8, 1974. (1):585-600. Paper 1997.

Inland pool and high seas tests proved the Lockheed Prototype High Seas Oil Recovery System to be capable of recovering oil up to the rate of 1000 gpm under certain current, oil thickness, and viscosity conditions. The system proved that it will be capable of surviving a severe sea state condition after minor redesign.

Design and engineering

Citation Source: The Engineering Index Monthly. 12(11).
Entry #074497.

C-590-74
SUCCESSES AND FAILURES WITH OIL SPILLS IN THE SOUTHEASTERN INLAND WATERS

Smith, A. J. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. P. 583-588.

A brief review of several recent spill cases includes descriptions of differences in containment, retention and removal methodology. Results vary from 90% recovery with small cost to high cleanup costs and difficult recovery operations.

Containment
Economic effects of oil pollution

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13149F.

C-591-74
JET OIL RECOVERY DEVICE

Stewart, J. K. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. P. 601-615.

The operating characteristics of a Jet Oil Recovery Device are described. The concept behind the device involves utilization of the surface tension characteristics of oil along with the device's hydraulic jet action to lift floating oil over a non-adjustable weir.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13020G.

C-592-74
TESTING OF NEW DEVICE FOR REMOVING OIL SLICKS FROM THE SURFACE OF OPEN WATER

Tezuka, T., and K. Aramaki. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper, Houston, Texas, May 6-8, 1974. (1):625-636. Paper 2000.

A description of an oil recovery device designed for large-scale oil spillage recovery as well as small spillage retrieval under various wave, wind and current conditions is given. The recovery system is fast and efficient, equipped with an expandable skimming width, which can recover a large amount of oil in a short period of time.

Citation Source: The Engineering Index Monthly. 1974. 12(11).
Entry #074500.

C-593-74
RESOURCE RECOVERY AND THE U.S. INTERNATIONAL TRADE: THE CASE OF WASTE OIL

Walter, I., and S. P. Maltezou. 1974.
Environmental Affairs 3(3):433-436.

The report views waste oil recovery in depth, as it relates to the problems of improper waste oil disposal, of energy shortages, and of creating incentives for its reuse. The potential import-saving by converting waste oil to heating oil is estimated.

Citation Source: Environment Abstracts. 1974. 4(12).
Entry #03-74-10055.

C-594-74
WASTE OIL RECYCLING AND DISPOSAL

Weinstein, N. J. 1974.
Environmental Protection Agency, Cincinnati, Ohio, Technology Series. GPO Sup. Doc. EP1.23:670/2-74-052. 327 p.

Information on the sources and quantities of waste oils, current and potential recycling and disposal methods, and the environmental effects of these methods is presented.

Citation Source: Selected Water Resources Abstracts. 1974. 7(23).
Entry # W74-12215.

C. EFFECTS OF OIL POLLUTION

1. Biological Effects

C-595-74
OIL IN SEA: WOEFUL LACK OF KNOWLEDGE

Anon. 1974.
Chemical & Engineering News 53(2):30.

The article discusses the findings and shortcomings of the just released report, "Petroleum in the Marine Environment," prepared by the National Academy of Sciences. The report concludes that the most damaging effects of oil are the oiling of beaches and the endangering of seabird species and benthic communities along polluted coastlines. The effect of oil contamination on human health is reported not to be cause for alarm.

Citation Source: Citation Journal.

C-596-74
FATE AND EFFECTS OF OIL POLLUTANTS IN EXTREMELY COLD MARINE ENVIRONMENTS

Atlas, R. M. 1974.
Government Reports Announcements 74(2):141.

Interaction studies on microorganisms and Prudhoe crude oil in Alaskan coastal waters were conducted in an effort to obtain information on the possible effects of accidental oil spills on the indigenous biological populations and the fate of spilled oil.

General fate of oil in the environment

Citation Source: Oceanic Abstracts. 1974. 11(6).
Entry # 74-05550.

C-597-74
THE EFFECT OF CRUDE OIL FRACTIONS ON THE SURVIVAL OF A TIDEPOOL COPEPOD, TIGRIOPUS CALIFORNICUS

Barnett, C. J., and J. E. Kontogiannis. 1975.
Environmental Pollution 8(1):45-54.

From studies of the effects of diesel oil, kerosene, gasoline and benzene on the survival of the copepod, *T. californicus*, it was found that the more slowly evaporating crude oil fractions are most hazardous to the organisms; the copepod's survival is inversely proportional to the concentration of the crude oil fraction in the environment.

Citation Source: Citation Journal.

C-598-74
TOXICITY OF OIL SINKING AGENTS

Blackman, R. A. A. 1974.
Marine Pollution Bulletin 5(8):116-118.

Brown shrimp were used to test the toxicity of different combinations of oil sinking agents in solvents. Careful choice of wetting agent and solvent reduces harmful effects.

Cleanup and recovery

Citation Source: Chemical Abstracts. 1975. 82(7). Entry #39191f.

C-599-74
EFFECTS OF AN OIL SPILL REMOVER ON BEACH MEIOFAUNA

Bleakley, R. J., and P. J. S. Boaden. 1974.
Annales de L'Institut Oceanographique 50(1):51-58.

In studies examining the effects of an oil spill remover and the surfactant alone on the meiofauna of intertidal sand, it was found that the organisms are able to survive the effects of diluted detergent, but concentrations greater than 100 ppm detergent are toxic. The meiofauna recover slowly because of the persistence of the detergents found in high concentrations in the sand on oil-contaminated beaches.

Citation Source: Selected Water Resources Abstracts. 1975. 8(1).
Entry # W75-00449.

C-600-74
RESPIRATORY RESPONSE OF JUVENILE CHINOOK SALMON AND STRIPED BASS EXPOSED TO BENZENE, A WATER-SOLUBLE COMPONENT OF CRUDE OIL SPILLS

Brocksen, R. W., and H. T. Barley. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 783-791.

Exposure to sublethal doses of benzene for periods of up to 48 hours increased the respiratory rate of juvenile chinook salmon 115%. Longer exposure caused a decrease in the respiration rate due to a reversible narcotic state.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13100G.

C-601-74

THE RESPONSE OF MACROINVERTEBRATES TO GASOLINE POLLUTION IN A MOUNTAIN STREAM

Bugbee, S. L., and C. M. Walter. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 725-731.

The majority of aquatic invertebrates and ~2500 fish were killed in an area extending 2 miles downstream from a spill of aviation gasoline. Certain species were unable to recolonize for 6 months, reducing the species diversity; however, recovery was complete after 3 years.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13098F.

C-602-74

BIRD USAGE OF MARSH PONDS SUBJECTED TO OIL SPILLS

Chabreck, R. H. 1973.
Proceedings of the Louisiana Academy of Science 36:101-110.

A comparison of bird inventories conducted over a 2-year period in ponds affected by recent oil spills and in control ponds was made. Although no dead birds were found, birds used the oil-polluted ponds less frequently than the control ponds. Both usage and vegetative growth increased after the first six months.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13043B.

C-603-74

A STUDY OF THE EFFECTS OF THE SAN FRANCISCO OIL SPILL ON MARINE ORGANISMS

Chan, G. L. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 741-781.

Much of the marine fauna in the area has died from being smothered by oil. Marine snails have suffered less mortality than the more sedentary animals such as sessile barnacles; although the striped shore crab has disappeared in the spill-affected San Francisco waters. After 2 years, recruitment is approaching normal, and evidence of the oil spill is hardly visible.

Monitoring

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13099M.

C-604-74

A REINVESTIGATION OF SOUTHERN CALIFORNIA ROCKY INTERTIDAL BEACHES THREE AND ONE-HALF YEARS AFTER THE 1969 SANTA BARBARA OIL SPILL: A PRELIMINARY REPORT

Cimberg, R., S. Mann, and D. Straughan. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 697-702.

Post-spill data from ten southern California beaches in 1969, 1970, and 1972 were analyzed. The two important factors affecting the presence of marine animals on these beaches were sand movement and substrate stability. The effect of the 1969 Santa Barbara oil spill on the presence of organisms was reported to be less important than other environmental factors.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13095M.

C-605-74

ACUTE EFFECTS OF OUTBOARD MOTOR EFFLUENT ON TWO MARINE SHELLFISH

Clark, R. C., Jr., and J. S. Finley. 1974.
Environmental Science & Technology 8(11):1009-1014.

When mussels (Mytilus edulis) and oysters (Ostrea lurida) were exposed to diluted effluent from a two-cycle outboard motor in a seawater system, physiological stress, gill tissue degeneration and uptake of paraffin hydrocarbons from the effluent were observed in the organisms. The mussels demonstrated a greater negative response to the pollutant than did the oysters.

Citation Source: Citation Journal.

C-606-74

INTERAGENCY INVESTIGATIONS OF A PERSISTENT OIL SPILL ON THE WASHINGTON COAST

Clark, R. C., Jr., J. S. Finley, B. G. Patten, S. F. Stefano, and E. E. DeNiki. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 793-808.

The effects of continuous leakage of oil from a grounded ship include dead urchins and damaged plants. N-paraffin hydrocarbons were taken up by the plants and animals and the residual patterns of the exposed organisms resembled hydrocarbon patterns of the pollutant.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13101M.

C-607-74
EFFECT OF A BUNKER FUEL ON THE BEACH BACTERIAL FLORA

Cobet, A. B., and H. E. Guard. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 815-819.

After a Bunker fuel cleanup operation, sampling revealed that neither the size of the bacterial population nor the distribution of bacterial genera were affected by the remaining hydrocarbons. Only 15% of the beach bacteria were affected.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13103M.

C-608-74
KEROSINE-LIKE TAINT IN THE SEA MULLET, MUGIL CEPHALUS. I. COMPOSITION AND ENVIRONMENTAL OCCURRENCE OF THE TAINTING SUBSTANCE

Connell, D. W. 1974.
Australian Journal of Marine and Freshwater Research 25(1):7-24.

Sediments containing hydrocarbons that closely resemble kerosine in composition, were found in the gut of tainted sea mullet captured in the Brisbane River, and were believed to be the cause of the kerosine-like tainting of the flesh.

Citation Source: Chemical Abstracts. 1974. 81(25). Entry #164182j.

C-609-74
THE EFFECT OF A CRUDE OIL ON INTESTINAL ABSORPTION IN DUCKLINGS

Crocker, A. D., J. Cronshaw, and W. N. Holmes. 1974.
Environmental Pollution 7(3):165-177.

A study was conducted which examined the effects of oral doses of crude oil on the mucosal water and Na^+ transfer rates across the intestine of ducklings transferred from fresh water to saline drinking water. The presence of oil prevented the development of high mucosal transfer rates, which are essential for successful adaptation of the ducklings to hypertonic saline water conditions.

Citation Source: Citation Journal.

C-610-74
OIL POLLUTION IN THE CROMARTY FIRTH

Currie, A. 1974.
Marine Pollution Bulletin 5(8):118-119.

The threat of repeated oil spills (which cause many bird deaths) to the conservation of Cromarty Firth on the northeast coast of Scotland is reported.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13038M.

C-611-74
EFFECTS OF RESIDUAL TOXINS IN OIL REFINERY EFFLUENTS ON AQUATIC ORGANISMS

Dorris, T. C., S. L. Burks, and G. R. Waller. 1974.
Completion Report, Oklahoma State University, Water Resources Research Institute, NTIS Report PB-235 919. 79 p.

Oil refinery waste waters were partially evaporated and the toxicity of the original samples and overhead and bottom product fractions from the evaporator were evaluated by static bioassays with fathead minnows. It was concluded that partial evaporation removes toxic substances from biologically treated refinery waste waters, produces an overhead product water which has low inorganic salt concentration and should be reusable for boiler makeup, and produces a partially concentrated bottom water generally less toxic.

Citation Source: Selected Water Resources Abstracts. 1974.
7(23). Entry # W74-12348.

C-612-74
EFFECTS OF OIL ON MARINE ECOSYSTEMS: A REVIEW FOR ADMINISTRATORS AND POLICY MAKERS

Evans, D. R., and S. D. Rice. 1974.
NOAA Fishery Bulletin 72(3):625-638.

A review of recent literature concerning the effects of oil on marine ecosystems is given to provide an information source for administrators and policy makers. Characteristics of crude oil and the danger of chronic low-level pollution are included topics.

Analysis

Citation Source: Environment Abstracts. 1974. 4(12).
Entry #12-74-10216.

C-613-74

PETROLEUM HYDROCARBONS IN NARRAGANSETT BAY: I. SURVEY OF HYDROCARBONS IN SEDIMENTS AND CLAMS (*MERCENARIA MERCENARIA*)

Farrington, J. W., and J. G. Quinn. 1973.
Estuarine and Coastal Marine Science 1(1):71-79.

Results from analyses of hydrocarbons in surface sediments from 8 stations and in clams, *M. mercenaria*, from three stations in Narragansett Bay have shown that both contain a complex mixture of hydrocarbons which is not present in clams from a relatively unpolluted pond that was analyzed. The most probable source of the hydrocarbons is petroleum pollution from sewage effluent and small oil spills.

Analysis

Citation Source: Biological Abstracts. 1974. 58(11).
Entry #60024.

C-614-74

EXPERIMENTAL ECOSYSTEMS TO MEASURE FATE OF OIL SPILLS DISPERSED BY SURFACE ACTIVE PRODUCTS

Gatellier, C. R., J. L. Oudin, P. Fusey, J. C. Lacaze, and M. L. Priou. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 497-504.

The effect of several oil dispersants on polluted ecosystems was determined by measuring residual hydrocarbons and photosynthetic and residual toxicity. Most dispersants increased photosynthetic inhibition and stopped bacterial decomposition. Mixtures of true dispersants and fertilizers were favorable to both plankton and bacteria.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13059M.

C-615-74

EFFECTS OF SEAWATER EXTRACTS OF CRUDE OIL ON CARBON BUDGETS IN TWO SPECIES OF MUSSELS

Gilfillan, E. S. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 691-695.

Salinity and crude oil combinations were used to stress animals utilized for carbon budgets. Both reduced salinity and crude oil decreased the net carbon balances for each species.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13094M.

C-616-74
EFFECTS OF OIL AND EMULSIFIERS ON EGGS AND LARVAE OF NORTHERN PIKE (ESOX LUCIUS) IN BRACKISH WATER

Hakkila, K., and A. Niemi. 1973.
Aqua Fennica. p. 44-59.

In experiments studying the effects of Russian crude oil and some emulsifiers on Northern Pike eggs and larvae in brackish water, results indicated the emulsifier Neste A, Talestol (surfactant), crude oil dispersed with Neste A, and contact with floating oil increased the mortality of developing eggs. All substances increased the occurrence of abnormal larvae.

Citation Source: Selected Water Resources Abstracts. 1975.
8(1). Entry # W75-00432.

C-617-74
OIL AND THE SEA - THE ECOLOGICAL IMPLICATIONS OF A CONTROVERSIAL INVASION

Hay, K. G. 1974.
Marine Technology Society Journal 8(1):19-20.

The findings of a research investigation made by the American Petroleum Institute studying the fate and effects of oil in the marine environment are presented. The topics of information include the fate and immediate and long-term impact of oil, biological damage to an ecosystem, mechanisms of organism uptake, and toxicity and solubility of refined oil and crude oil aromatics and various oil dispersants.

Physical changes of oil in the environment

Citation Source: Environmental Health and Pollution Control.
1974. 6(3). Entry #1093.

C-618-74
RELATIONSHIP BETWEEN SEDIMENT OIL CONCENTRATIONS AND THE MACROINVERTEBRATES PRESENT IN A SMALL STREAM, FOLLOWING AN OIL SPILL

Hoehn, R. C., J. R. Stauffer, M. T. Mosnik, and C. H. Hocutt.
1974.
Environmental Letters 7(4):345-352.

The study assessed the effects of an oil spill on macroinvertebrate species in a small creek in Virginia. It was concluded that water-soluble fractions of oil had a toxic effect on the invertebrates, reducing their numbers at examined sites in the creek.

Citation Source: Citation Journal.

C-619-74
THE DISTRIBUTION AND ECOLOGY OF MARINE BIRDS OVER THE CONTINENTAL SHELF OF ARGENTINA

Jehl, J. R., Jr. 1974.
Translations of the San Diego Society of Natural History 17(16): 217-234.

Quantitative information on the distribution and abundance of marine birds in winter, 1971-1972, on the coastal shelf of Argentina is presented. Included in the report is a discussion of the resource utilization by the birds and a suggestion that oil pollution is a major cause of sea bird mortality.

Citation Source: Biological Abstracts. 1975. 59(1).
Entry #1272.

C-620-74
EFFECTS OF PRUDHOE BAY CRUDE OIL ON MOLTING TANNER CRABS, CHIONOECETES BAIRDI

Karinen, J. F., and S. D. Rice. 1974.
Marine Fisheries Review 36(7):31-37.

Laboratory studies were conducted in which premolt and post-molt juvenile male Tanner crabs from Alaskan waters were exposed to Prudhoe Bay crude oil. Crabs were found to be affected by the oil and molting success was found to decrease with increasing oil exposure. Results suggest that oil spilled in Alaskan waters would harm the Tanner crab resources.

Citation Source: Government Reports Announcements. 1974.
74(23). Entry #COM-74-50189-07-08/GA.

C-621-74
THE TOXICITY OF CRUDE OIL AND ITS COMPONENTS TO FRESHWATER ALGAE

Kauss, P., T. C. Hutchinson, C. Soto, J. Hellebust, and M. Griffiths. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 703-714.

Field tests studying the effects of crude oil on freshwater algae indicate that the responses to oil are species-specific, varying from suppression to stimulation of growth. The toxicity of 7 different crude oils on Chlorella vulgaris was variable in lab experiments. Results suggest that short-term toxicity of oils is due to the rapid loss of volatile compounds and differences in toxicity of selected aromatic compounds (benzene, toluene, O-xylene).

Citation Source: Senior Author.

C-622-74
DISPERSING OIL ON THE SEA

Kerr, D., W. W. Mansfield, K. C. Pirani, and D. Tranter. 1974.
Search 5(9):424-428.

The report describes the results of an investigation by the Australian Commonwealth Department of Transport, to prepare and assess materials and equipment capable of removing oil slicks from coastal water without adversely affecting marine life. Various dispersants are classified and discussed in respect to their effectiveness, ease of storage and transport, and toxicity.

Citation Source: Citation Journal.

C-623-74
THE EFFECTS OF THREE ANTI-PETROLEUM AGENTS ON THE PRIMARY PRODUCTIVITY OF AN EXPERIMENTAL COMMUNITY OF BENTHIC DIATOMS

Lacaze, J. C. 1972/1973.
Vie et Milieu Serie B Ocenaographie 23(1):51-67.

The short-term and long-term effects of three anti-oil emulsifying agents on the productivity of an experimental community of benthic diatoms were studied. Two of the anti-oil agents, Sefoil and Corexit, showed no toxicity under experimental conditions; however, the third agent, Gamosol, was shown to be distinctly toxic to the organisms.

Citation Source: Biological Abstracts. 1975. 59(2).
Entry #7516.

C-624-74
EFFECTS OF OIL SPILL DISPERSANTS ON THE EARLY DEVELOPMENT OF BALTIC HERRING

Lindén, O. 1974.
Annales Zoologici Fennici 11(2):141-148.

The fertilized eggs and larvae of the Baltic herring Clupea harengus membras L. were exposed to different concentrations of two oil spill dispersants, BP 1100X and Finasol S.C. A concentration as low as 1 ppm Finasol S.C. induced abnormal cell division and malformed embryos; and with increasing concentration, both dispersants caused an increased number of malformed larvae and a decreased percentage of successful hatching. Exposed larvae were more sensitive to the dispersants than the herring eggs.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(9). Entry #4Q9606M.

C-625-74
THE EFFECTS OF DIESEL FUEL ON A STREAM

Lund, J. M. 1974.
Fauna (Oslo) 27(2):78-80.

The paper is a summary of R. B. Bury's report appearing in "California Fish and Game," 1972. Norway is presently concerned with the topic of stream oil pollution, since a tanker lost 2000 tons of diesel fuel in the sea north of Tromso in November, 1973, resulting in the deaths of 2000 seabirds.

Citation Source: Biological Abstracts. 1975. 59(2). Entry #11389.

C-626-74
THE EFFECTS OF POLLUTANTS ON MARINE MICROBIAL PROCESSES: A FIELD STUDY

Mitchell, R. 1974.
Technical Report, No. TR-6, Contract N00014-67-A-0298-0026. 44 p.

In a field study measuring the effects of chemical pollutants on Red Sea corals, it is demonstrated in the results that low concentrations of crude oil, copper and available organic matter, which did not kill corals directly, upset the microbiological balance on the coral surface. Changes on the coral surface eventually led to the death of the colonies.

Citation Source: Government Reports Announcements. 1974. 7(26). Entry #AD-787 602/2GA.

C-627-74
EFFECT OF CHRONIC OIL POLLUTION ON A POLYCHAETE

Mohammed, M-B., M. 1974.
Marine Pollution Bulletin 5(2):21-24.

Results from studies measuring the growth and survival of the tube-building polychaete Pomatoleios kraussii, on plates immersed in oil-effected waters at an oil terminal and in oil-free waters at Kuwait are described.

Citation Source: Citation Journal.

C-628-74
EFFECTS OF OIL ON MARINE ORGANISMS: A CRITICAL ASSESSMENT OF PUBLISHED DATA

Moore, S. F., and R. L. Dwyer. 1974.
Water Research 8(10):819-828.

The focus of the paper is to summarize the effects of oil on individual organisms. Oil effects on an organism are classified as lethal toxicity, sublethal toxicity, coating, habitat alteration, and incorporation. The ranges of soluble aromatic hydrocarbon concentration in which marine organisms may exhibit lethally toxic and sublethally toxic effects are given.

Citation Source: Citation Journal.

C-629-74
UPTAKE AND DISCHARGE OF PETROLEUM BY BARNACLES

Morris, R. J. 1973.
Marine Pollution Bulletin 4(7):107-109.

Research efforts studying the hydrocarbon content of Lepas fascicularis living on tar balls and the composition of the tar balls have indicated that oil hydrocarbons are assimilated by the barnacles and then discharged, unmetabolized, in a short period of time.

Citation Source: Oceanic Abstracts. 1974. 11(6).
Entry #74-05609.

C-630-74
BACKGROUND PAPERS FOR A WORKSHOP ON INPUTS, FATES, AND EFFECT OF PETROLEUM

National Academy of Sciences. 1973.
Contract N00014-67-A-0244-0028. 479 p.

The following are some of the topics discussed in the volume on petroleum pollution: occurrence and amount of pelagic tar in the open ocean, biological fates of hydrocarbons in aquatic organisms, biological effects of chronic oil pollution on coastal ecosystems, and uptake and depuration of specific hydrocarbons from oil by two bivalves.

Citation Source: Government Reports Announcements. 1974.
74(22). Entry #AD-783 990/5GA.

C-631-74
BACKGROUND PAPERS FOR A WORKSHOP ON INPUTS, FATES, AND EFFECTS OF PETROLEUM IN THE MARINE ENVIRONMENT. VOLUME I.

National Academy of Sciences. 1973.
Contract N00014-67-A-0244-0028. 391 p.

The following are some of the topics discussed in the volume on petroleum pollution: sources of oil entering the sea, petroleum inputs to the marine environment, analytical techniques to determine oil contamination in marine organisms and hydrocarbon biodegradation kinetics.

Biological degradation

Citation Source: Government Reports Announcements. 1974.
74(22). Entry #AD-783 989/7GA.

C-632-74
OIL POLLUTION AND MARINE ECOLOGY

Nelson-Smith, A. 1973.
Plenum Press, New York. 260 p.

The volume examines spilt oil in the sea with reference to its physical and chemical characteristics, behavior at sea, detection, identification and analysis, and its effects on marine organisms and resident birds and mammals. Recommended methods for removing spilt oil are presented.

Physical changes of oil in the environment
Chemical changes of oil in the environment

Citation Source: Selected Water Resources Abstracts. 1974.
7(21). Entry # W74-11166.

C-633-74
EFFECTS OF WATER SOLUBLE EXTRACTS OF OIL ON PHYTOPLANKTON

Nuzzi, R. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 809-813.

Soluble constituents of No. 2 fuel oil are toxic to bacteria-free phytoplankton cultures and also affect natural populations.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13102G.

C-634-74
EFFECT OF CHRONIC OIL CONTAMINATION ON AQUATIC DIPTERANS: A STATE OF THE ART REPORT

Parker, B. L., and J. D. Brammer. 1974.
Vermont Water Resources Research Center, Burlington, Completion Report. OWRT A-018-VT(1). 14-31-1-4046. NTIS Report PB-237 499. 32 p.

"A literature search was conducted to compile a state of the art report and the research needs in the area of petroleum pollution in aquatic environments." The biological effects of oil contamination on marine aquatic organisms, with particular emphasis on aquatic dipterans, was one of the topics reviewed. No research literature was found on the effects of low level, chronic oil pollution on aquatic insects, and research needs in this area were outlined.

Citation Source: Selected Water Resources Abstracts. 1975. 8(3). Entry # W75-01336.

C-635-74
THE EFFECTS OF A NO. 2 FUEL OIL AND TWO CRUDE OILS ON THE GROWTH AND PHOTOSYNTHESIS OF MICROALGAE

Pulich, W. M., Jr., K. Winters, and C. Van Baalen. 1974.
Marine Biology 28(2):87-94.

The paper reports the effects of two crude oils and water solubles from these oils and from a No. 2 fuel oil on the growth and photosynthesis of pure cultures of microalgae.

Citation Source: Citation Journal.

C-636-74

A CONTINUOUS FLOW KINETIC MODEL TO PREDICT THE EFFECTS OF TEMPERATURE ON THE TOXICITY OF OIL REFINERY WASTE TO ALGAE

Reynolds, J. H., E. J. Middlebrooks, and D. B. Porcella. 1973.
Utah Water Research Laboratory, Logan, Research Report. OWRR B-070-UTAH(2). 14-31-0001-3659. NTIS Report PB-237 669.

Equations have been developed, using continuous flow, stirred tank, reactor kinetics and enzyme inhibition kinetics, to determine the effects of temperature on the toxicity of oil refinery wastes to microorganisms. It is indicated from the results that phenol exerts a competitive inhibition effect on the algae Selenastrum capricornutum and that phenol toxicity increases with an increase in temperature.

Citation Source: Selected Water Resources Abstracts. 1975.
8(3). Entry # W75-01408.

C-637-74

TOXICITY AND AVOIDANCE TESTS WITH PRUDHOE BAY OIL AND PINK SALMON FRY

Rice, S. D. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 667-670.

Acute toxicity concentration levels were determined for Prudhoe Bay crude oil on pink salmon fry in fresh and salt water. The observed 96-hour TLM values were lower in freshwater fry than in saltwater animals (88 mg oil/liter vs. 213 mg/liter in June). Older fry were more susceptible to oil toxicity and more sensitive in detecting and avoiding oil than were the younger fry.

Citation Source: Author.

C-638-74

3-4 BENZOPYRENE POLLUTION IN SOME AREAS OF THE ADRIATIC

Scaccini Cicatelli, M. 1973.
In: Proceedings of the 5th International Colloquium of Medical Oceanography, Messina, October 4-7, 1974. S. Genovese (editor). Messina, Italy. p. 573-581.

3-4 Benzopyrene, the most carcinogenic polycyclic hydrocarbon, was found to be present in the marine benthos collected in the northern and central Adriatic. The pollution affected plankton and numerous organisms including some fish species in which the hydrocarbon was present in the edible parts.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(9). Entry #4Q9602M.

C-639-74
ACCUMULATION, RELEASE AND RETENTION OF PETROLEUM HYDROCARBONS BY THE OYSTER, CRASSOSTREA VIRGINICA

Stageman, J. J., and J. M. Teal. 1973.
Marine Biology 22(1):37-44.

After exposing two populations of *C. virginica* to a complex petroleum hydrocarbon fraction, the hydrocarbons were accumulated by both groups; rate and extent of uptake of the materials were related to the lipid content of the populations and hydrocarbon concentration in the water. Other factors involved with uptake, retention and release of hydrocarbons wher transferred to uncontaminated conditions are discussed.

Citation Source: Oceanic Abstracts.

C-640-74
ENGLISH, GULF INCIDENTS SHOW OIL/FISH PROBLEMS

Townes, B. 1975.
National Fisherman 55(11):20-A.

A major problem relating to the North Sea, New England, and U.S. Gulf Coast waters is the need to integrate both fishing and oil-related industries in these common waters. The possibility of fish-killing oil spill occurrences is a concern of the fishermen; however, oil companies claim the chance of such oil spills from offshore drilling has been minimized.

Citation Source: Citation Journal.

C-641-74
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION: ASHLAND OIL INCOPPORATED, CATLETTSBURG, KENTUCKY

Vandervort, R., and J. B. Lucas. 1974.
NTIS Report PB-232 725/2WP. 18 p.

The report describes the effects of exposure to flaked and molten petroleum pitch at the Asphalt Department of Ashland Oil, Catlettsburg, Kentucky; as determined by the National Institute for Occupational Safety and Health. Normal concentrations of petroleum pitch produce seasonal phototoxic reactions in the employees examined.

Citation Source: Environment Abstracts. 1975. 5(1).
Entry #02-75-00290.

C-642-74
OIL SPILL, LONG ISLAND SOUTH, MARCH 21, 1972, ENVIRONMENTAL EFFECTS

Vast, Inc. 1973.
NTIS Report PB-230 340/2WP. 146 p.

The paper describes the studies conducted to determine the effects of a No. 2 fuel oil spill on benthic communities in Niantic Bay. Species density and diversity were measured at several stations and samples of the biota were chromatographically analyzed for oil content. Results showed one area, the mid-bay station, to be contaminated.

Citation Source: Environment Abstracts. 1974. 4(12).
Entry #12-74-10228.

C-643-74
ARRESTANT EFFECT OF POLYOXYETHYLENE ESTERS ON SWIMMING IN THE WINTER FLOUNDER

Wildish, D. J. 1974.
Water Resources 8(8):579-583.

The paper reports that sublethal concentrations of the oil dispersant Gulf Agent 1009 Lot No. LS-3712, has been shown to suppress the endogenous tidal rhythm and reduce the swimming amplitude in the winter flounder.

Citation Source: The Engineering Index Monthly. 1974.
12(11). Entry #074487.

C-644-74
THE FATE AND BEHAVIOR OF CRUDE OIL ON MARINE LIFE

Yentsch, C. S., E. S. Gilfillan, and J. R. Sears. 1973.
Final Report, No. USCG-D-9-75, CGR/DC-4/74, Contract DOT-CG-13992-A. 69 p.

Results from the study examining the physiological effects of crude oil on marine organisms have indicated that crude oil, although not acutely toxic to test organisms has been found to cause serious metabolic disorders in both plants and animals. Such effects could lead to a reduction in the net amount of carbon available for growth and reproduction.

Citation Source: Government Reports Announcements. 1974.
7(25). Entry #AD-786 584/3GA.

C-645-74

ALKANES AND ALKENES IN MARINE BENTHIC ALGAE

Youngblood, W. W., and M. Blumer. 1973.
Marine Biology 21(13):163-172.

Concentrations of saturated and olefinic hydrocarbons were determined in benthic marine algae species near Cape Cod. It was found that the alkene to alkane ratio and polyolefinic content were highest in young plants and rapidly growing tissues of older plants, suggesting considerable hydrocarbon involvement in the cell biochemistry.

Citation Source: Selected Water Resources Abstracts. 1974. 7(22). Entry # W74-11951.

2. PHYSICAL EFFECTS

C-646-74
OIL SPILLS IN THE ARCTIC OCEAN: EXTENT OF SPREADING AND POSSIBILITY OF LARGE-SCALE THERMAL EFFECTS

Ayers, R. C., Jr., H. O. Jahns, and J. L. Glaeser. 1974.
Science 184(4166):843-845.

A discussion and general conclusions are presented concerning oil-spreading mechanisms at the air-water interface in the Arctic Ocean and significant heat balance effects of oil spills on these waters.

Citation Source: Citation Journal.

C-647-74
LARGE-SCALE EXPERIMENTS ON THE SPREADING OF OIL AT SEA AND ITS DISAPPEARANCE BY NATURAL FACTORS

Jeffery, P. G. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 469-474.

The spreading pattern of an experimental discharge of 120 tons of Iranian light crude oil in the North Atlantic is described. After a period of four days, only a few patches of thicker oil remained. Blokker constants for the observed spreading were reasonably constant.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13056M.

C-648-74
INFLUENCE OF NATURAL LIGHT ON THE BIODEGRADATION OF A NONIONIC SURFACTANT USED FOR DISPERSING OIL SLICKS AT SEA

Lacaze, J. C. 1974.
EPA-TR-59-75. Translations of Academie des Sciences, Paris.
Comptes Rendus 277(4):409-412. 10 p.

In studying the influence of light on the biodegradation of a nonionic surfactant, results indicate that even weak light may considerably slow down the process.

Citation Source: Environmental Health and Pollution Control.
1974. 6(3). Entry #872.

3. CHEMICAL EFFECTS

C-649-74
POLLUTION IN THE MEDITERRANEAN

Holt, S. J. 1973.
Nature in Focus 17:5-9.

The introduction of oil among other pollutants has caused chemical changes in the Mediterranean. No effect on the fisheries is yet documented. International regulations to control these changes are considered.

International legislation

Citation Source: Oceanic Abstracts. 1975. 12(1).
Entry #75-00712.

C-650-74
AEROBIC DECOMPOSITION OF OIL POLLUTANTS IN SEDIMENTS

Shelton, T. B., and J. V. Hunter. 1974.
Journal of the Water Pollution Control Federation 46(9):2172-2182.

Data were collected on oil concentrations and oxygen utilization rates of natural bottom sediments containing oil pollutants in New Jersey rivers. Organic carbon is released with time from sediments containing oil by aerobic conditions in the overlying water. These conditions cause oil loss, although other organic compounds are lost more rapidly.

Citation Source: Chemical Abstracts. 1974. 81(26).
Entry #173199x.

D. OIL POLLUTION PREVENTION

1. DESIGN AND ENGINEERING

C-651-74
A NEW SALT-BASED MUD SYSTEM FOR THE NORTH SEA

Achterberg, A. 1973.
Society of Petroleum Engineers of AIME: Second Annual European Meeting. In: Society of Petroleum Engineers of AIME. SPE 4319. 8 p.

A new type of saltwater-based mud system was used successfully in 730 onshore wells and 4 offshore wells in the North Sea. The mud system was developed to improve well safety and as a pollution prevention unit for the environment.

Citation Source: Oceanic Abstracts. 1974. 11(6).
Entry #74-05775.

C-652-74
BURNING WASTE OIL

Anon. 1973.
Compressed Air 78(11):14-16.

In the article is described an oil burner which is used to burn up to 20,000 BPD of unrefinable crude oil during offshore well tests. The burner, which utilizes compressed air to atomize the waste, disposes of oil without polluting the air or surrounding waters.

Citation Source: Pollution Abstracts. 1975. 6(1).
Entry #75-00470.

C-653-74
DOUBLE BOTTOM BARGES PROVIDE GREATER PROTECTION AGAINST WATER POLLUTION

Anon. 1974.
Marine Engineering Log 79:42-43.

Ashland Oil, Inc., of Ashland, Kentucky, has recently replaced its older tank barges with 41 double-skin integrated tank barges for use in integrated tows of petroleum products. The double-skin construction provides for greater protection against oil spillage should the exterior shell of the barge hull be damaged.

Citation Source: Citation Journal.

C-654-74
TECHNICAL PROGRESS IN DRILLING AND DEVELOPMENT OF OFFSHORE HYDROCARBON RESOURCES

Cipa, W., and A. G. Gelsenberg. 1974.
Presented at 9th World Energy Conference, Detroit, September 22-27, 1974. p. 3.1-3. 19 p.

The developments in the area of underwater drilling and oil production equipment and techniques are reported. Oil pollution control, as related to these activities is also considered.

Citation Source: Environment Abstracts. 1974. 4(11).
Entry #11-74-09614.

C-655-74
CONTROL OF TANKER DEBALLASTING OPERATIONS

DeVial, R. M. 1973.
Shipbuilding and Shipping Record 122(22):29.

It is stated that total oil floating on the sea surface, due to intentional discharges from merchant ships, could possibly be reduced from 9 million tons/year to 3 million tons/year by the use of slop tanks and instrumented supervision of discharges. International marine regulations pertaining to oil discharge control are reviewed and the design requirements for a shipboard oil content monitoring instrument are discussed.

International legislation

Citation Source: Environmental Health and Pollution Control.
1974. 6(1). Entry #662.

C-656-74
LOAD-ON-TOP SYSTEM FOR CRUDE OIL TANKERS--EXPERIENCE AND POSSIBLE DESIGN IMPROVEMENTS

Overaas, S. 1974.
Society of Naval Architects and Marine Engineers Transactions 11. 7 p.

The efficiency of the load-on-top system for crude oil tanker loading was investigated by taking samples on board crude oil carriers under normal operating conditions. An improved arrangement for applying the load-on-top method was proposed, based on information from model tests and experience from operating tankers.

Citation Source: The Engineering Index Monthly. 1975. 13(1).
Entry #006396.

C-657-74
FLOATING OIL COLLAR MAY AID CONSERVATIONALISTS

Roberts, D. 1974.
The Engineer 283(6167):13.

An experimental model oil platform, the flotation oil collar, is being considered in an effort to solve Britain's problems of (1) shortages of deep water oil platform building sites, (2) enormous platform construction costs, and (3) the "blackening" of deep water building sites.

Citation Source: Citation Journal.

C-658-74
A NUMERICAL MODEL FOR SIMULATION OF OIL SPREADING AND TRANSPORT AND ITS APPLICATION FOR PREDICTING OIL SLICK MOVEMENT IN BAYS

Wang, S., and L-S. Hwang. 1975.
NTIS Report AD-780 424/8WP. 115 p.

The paper reports the development of a computer model for simulating oil spreading and transport at the air-water interface. The model, able to predict the oil size, shape and movement as a function of time after a spill originates, is a useful tool in directing effective control and cleanup activities once an oil spill occurs.

Cleanup and recovery

Citation Source: Environment Abstracts. 1975. 5(1).
Entry #12-75-00671.

2. OIL HANDLING

C-659-74
PATENTED COLLECTOR PAN HELPS CUT POLLUTION

Anon. 1974.
Oil & Gas Journal 72(46):91.

A collector pan system has been developed which is useful in the prevention of water pollution and aids in oil recovery from tank-car loading facilities. The system is composed of steel pans and aprons to catch spilled diesel fuel, oils, grease, etc., and prevents these wastes from entering nearby waterways or sewers.

Citation Source: Citation Journal.

C-660-74
TANK CLEANING AND SHORE RECEPTION - A NEED FOR INVESTMENT INCENTIVES

Anon. 1973.
Shipbuilding and Shipping Record 122(22):27 +33.

The lack of commercial incentives to construct shore reception facilities for the unloading of oily water from tankers is the concern of tanker owners. A reason for this lack of commercial incentives is that owners are reluctant to pay for oily waste reception and choose instead to dump their wastes at sea.

Citation Source: Environmental Health and Pollution Control.
1974. 6(1). Entry #612.

C-661-74
PRELIMINARY ENVIRONMENTAL ASSESSMENT OF PETROLEUM DELIVERY MARINE TERMINALS FOR EASTERN MASSACHUSETTS

Cox, G. V., and S. G. Chamberlain. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper, Houston, Texas May 6-8, 1974. (1):415-424. Paper 1978.

The paper summarizes the environmental aspects of eleven receipt alternatives for petroleum delivery marine terminals, including inner harbor terminals, island pier terminals and single-point-mooring systems. Each alternative was rated using a matrix value system. A deepwater crude receipt terminal was selected as the best economic, environmental and engineering option.

Citation Source: The Engineering Index Monthly. 1974. 12(11).
Entry #071929.

C-662-74

COMPUTER CONTROLS PIPELINE LEAKS

Crider. C. W. 1974.
Oil & Gas Journal 72(41):67-70.

A leak detection system has been developed by Colonial Pipeline Co., Atlanta, Georgia, and is able to detect oil losses as small as 10 bbl in tests with an oil delivery rate of 7500 bbl/hr.

Design and engineering

Citation Source: The Engineering Index Monthly. 1974. 12(12).
Entry #079617.

C-663-74

LEAK DETECTION IN UNDERWATER OIL PIPELINES

Jackson, P. A. 1973.
NOAA Report 272-23100-R2. NTIS Report COM-73-11776. 32 p.

A review of leak detection devices for underwater oil pipelines is given to provide pollution control information prior to construction of oil pipelines from deepwater tanker terminals to shore facilities.

Design and engineering

Citation Source: Selected Water Resources Abstracts. 1974.
7(23). Entry # W74-12065.

3. WASTE WATER TREATMENT

C-664-74
BIOCHEMICAL PURIFICATION AND REPEATED USE OF INDUSTRIAL SPRINKLER WASTE WATERS AT THE POLOTSK PETROLEUM REFINERY [English Translation]

Ageev, V. A., and V. A. Ermakov. 1974.
Khimiya Tekhnologiya Topliv i Masel 9:15-16.

The biochemical purification system of refinery waste waters is described.

Citation Source: Chemical Abstracts. 1975. 82(6).
Entry #34782q.

C-665-74
EMULSIFIED OILY WATER TREATING EQUIPMENT

Anon. 1974.
Technical Review 11(1):79-82.

An outline is provided for the treatment of oil-contaminated waste water utilizing a system newly developed by Mitsubishe Heavy Industries.

Citation Source: Selected Water Resources Abstracts. 1974.
7(24). Entry # W74-13281.

C-666-74
HYDE OIL-WATER SEPARATOR

Anon.
Product Information.

The Hyde oil-water separator is a gravity-type device which can be applied to almost any oil-water separation problem. The separator can reduce the oil content in water effluent to less than 5 ppm. The design and operation of the unit are reported.

Information Source: E. E. Heidenreich, Hyde Products, Inc.,
810 Sharon Dr., Westlake, Ohio 44145.

C-667-74
OIL/WATER CLEANER

Anon. 1975.
Chemical Engineering 82(1):78.

A new cleaning compound, Cleanbreak, is reported to effectively clean and separate oil/water wastes. The compound works by making a temporary dispersion of oil particles that agglomerate and rise to the surface. Cleanbreak acts on the oil layer, preventing the formation of an emulsified interface.

Citation Source: Citation Journal.

C-668-74
PACKAGE TYPE WASTE WATER TREATING APPARATUS

Anon. 1974.
Technical Review 11(1):83-84.

A package type device is described for use in effectively treating waste waters, including oily water. A coalescer is used for the primary treatment of oily water followed by installment of this apparatus which secondarily treats the water by a chemical flotation method.

Citation Source: Selected Water Resources Abstracts. 1974.
7(24). Entry # W74-13282.

C-669-74
FEASIBILITY TEST PROGRAM OF APPLICATION OF COALESCING PHASE OIL/WATER SEPARATORS TO SELF COMPENSATING FUEL TANKS IN SURFACE SHIPS

Arnaiz, J. B., and E. Batutis. 1974.
USCG-D-88-74, Contract DOT-CG-24290-A. 90 p.

An evaluation of the General Electric Coalescing Plate Oil/Water Separator concept as applied to ballast water discharges during routine fueling operations is reported.

Design and engineering

Citation Source: Government Reports Announcements. 1974.
Entry #AD-784 105/9GA.

C-670-74
EFFLUENT TREATMENT IN THE PETROLEUM INDUSTRY

Berne, F., and L. P. Aggarwal. 1974.
Effluent Water Treatment Journal 14(8):26-29.

The methods of treating effluent containing oily wastes as free oil or mechanically and chemically emulsified are described.

Oil handling

Citation Source: The Engineering Index Monthly. 1974. 12(12). Entry #077806.

C-671-74
SLASH COSTS BY RECYCLING TREATED WASTEWATER THROUGH SPECIAL FILTERS

Boris, D. 1974.
Power 118(4):140.

A treatment technique used to recycle refinery wastewater effluent for reuse in in-plant consumption is described.

Citation Source: Citation Journal.

C-672-74
COMPARATIVE TOXICITY OF SEPARATE COMPONENTS OF WASTE WATERS FROM THE KIRISH PETROLEUM REFINERY THAT HAD UNDERGONE BIOLOGICAL PURIFICATION [English Translation]

Donchenko, N. A., and N. M. Arshanits. 1974.
Khimiya Tekhnologiya Topliv i Masel 9:29-32.

Data are presented on the results of the biological purification of a mixture of industrial waste water and municipal sewage. The purified municipal waste solution was found to be harmless to brook trout fingerlings after a 64-fold dilution.

Biological effects of oil pollution

Citation Source: Chemical Abstracts. 1974. 81(26). Entry #175789p.

C-673-74
BIOLOGICAL TREATMENT - BEST PRACTICABLE CONTROL TECHNOLOGY FOR TREATMENT OF REFINERY AND PETROCHEMICAL WASTEWATERS

Ford, D. L., and L. F. Tischler. 1974.
American Chemical Society, Division of Petroleum Chemistry, Preprint 19(3):520-539. (Meeting, Atlantic City, New Jersey, September 8-13, 1974).

The waste treatment system process combined with biological treatment as used with refinery and petrochemical waste waters to produce high quality effluents is discussed.

Citation Source: The Engineering Index Monthly. 1975. 13(1).
Entry #006867.

C-674-74
STATE AND PROSPECTS FOR IMPROVING EQUIPMENT USED FOR THE BIOCHEMICAL PURIFICATION OF WASTE WATERS FROM PETROLEUM REFINERIES [English Translation]

Gerber, V. Ya. 1974.
Khimiya Tekhnologiya Topliv i Masel 9:10-14.

A review with six references.

Citation Source: Chemical Abstracts. 1975. 82(6).
Entry #34737d.

C-675-74
ULTRAFILTRATION OF SOLUBLE OIL WASTES

Goldsmith, R. L., D. A. Roberts, and D. L. Burre 1974.
Journal Water Pollution Control Federation 46(9):2183-2192.

The advantages of ultrafiltration in disposing of soluble oil waste are presented. Lower cost, very high oil removal efficiency and little pretreatment required are included among the beneficial aspects of the process.

Citation Source: Chemical Abstracts. 1974. 81(24).
Entry #158399u.

C-676-74
WATER MANAGEMENT TRENDS IN REFINERY COOLING SYSTEMS

Griffin, R. W. 1974.
American Society of Mechanical Engineers, [Pap.] 74-PET-15.

New regulations on waste water discharges make cation additions with nonchromate inhibitors necessary. Biocides are used daily.

Citation Source: Chemical Abstracts. 82(8).
Entry #47582z.

C-677-74

TREATMENT OF EMULSIFIED OIL WASTE CONTAINING SURFACE ACTIVE AGENTS (English Summary)

Hagiwara, K., Y. Murakami, and K. Nishiguchi. 1974.
Osaka Kogyo Gijutsu Shikensho Kiho 8(1):61-63.

The treatment of bubbling ozone into oil waste water effectively removes surface-active agents after removal of oil by other methods.

Citation Source: Chemical Abstracts. 1974. 81(22).
Entry #140541z.

C-678-74

WASTE WATER RECYCLED FOR USE IN REFINERY COOLING TOWERS

Hart, J. A. 1973.
Oil and Gas Journal 71(24):92-96.

Described is Mobile Oil's program to minimize water contamination in the Indiana Harbor Canal, which is the source of input water for its East Chicago Refinery.

Citation Source: Pollution Abstracts. 1975. 6(1).
Entry #75-00520.

C-679-74

EVALUATION OF A UNIQUE CENTRIFUGE FOR SEPARATION OF OIL FROM SHIP DISCHARGE WATER

Harvey, A. C., and V. K. Stokes. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 391-402.

Described is a centrifugal coalescer designed and tested for oil separation as it disperses in ship bilge and ballast water. The design, development and laboratory tests of the coalescer are evaluated.

Design and engineering

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13013G.

C-680-74
PURIFICATION OF WASTE WATERS AT THE NOVO-GORKY PETROLEUM REFINERY [English Translation]

Klochkov, O. N., and M. A. Denisov. 1974.
Khimiya Tekhnologiya Topliv i Masel 9:34-37.

The treatment for the purification of oil refinery waste waters is described.

Citation Source: Chemical Abstracts. 1974. 81(26).
Entry #175791h.

C-681-74
BIOCHEMICAL PURIFICATION OF WASTE WATERS FROM THE GROZNY GROUP OF PETROLEUM REFINERIES [English Translation]

Mantrov, V. P. 1974.
Khimiya Tekhnologiya Topliv i Masel 9:32-34.

The biochemical purification process for petroleum waste waters is described.

Citation Source: Chemical Abstracts. 1974. 81(26).
Entry #175790g.

C-682-74
DETERMINATION OF SMALL AMOUNTS OF OIL IN WASTE WATER [English Summary]

Matsumoto, R., I. Taguchi, and T. Ishiguro. 1974.
Tetsu To Hagane 60(13):2056-2061.

Concentrations as low as 0.1 ppm of oil in waste water can be determined using the absorption of sericite powder and then determining the carbon content of the powder. A recommended procedure, considering factors such as the pH effect, is given.

Analysis

Citation Source: Chemical Abstracts. 1975. 82(8).
Entry #47481r.

C-683-74
TREATMENT OF OILY WASTE WATER USING ACTIVATED CARBON

Matsumoto, T., M. Inoue, T. Takeuchi, and E. Sugimoto. 1974.
Mitsui Zosen Giho (Mitsui Shipbuilding Technical Review) 85:1-10.

Results are presented on experiments where oily waste water was treated using activated carbon. In the system 10 ppm oil were contained in the solution at the inlet of the fluidized bed adsorption column, and less than 1 ppm oil was present at the outlet.

Citation Source: Selected Water Resources Abstracts. 1974.
7(24). Entry # W74-13287.

C-684-74
CHARACTERISTICS AND HYGIENIC EFFECTIVENESS OF MEASURES FOR THE SANITARY PROTECTION OF RESERVOIRS [English Translation]

Murzakaev, F. G., and A. A. Mingazetdinov. 1974.
Khimiya Tekhnologiya Topliv i Masel 9:22-24.

Described are the measures undertaken by petroleum refineries in the Bashkiria region to protect water reservoirs and improve nearby river quality.

Citation Source: Chemical Abstracts. 1975. 82(6).
Entry #34783r.

C-685-74
ULTRAFILTRATION REMOVAL OF SOLUBLE OIL

Nordstrom, R. P., Jr. 1974.
Pollution Engineering 6(10):46-47.

A new process utilizing ultrafiltration membranes for the treatment of emulsified oil wastes in the metal working industry is described.

Citation Source: The Engineering Index Monthly. 1974. 12(12).
Entry #081944.

C-686-74
THE COANDA-EFFECT OIL-WATER SEPARATOR: A FEASIBILITY STUDY

Pal, D. 1974.
Technical Note 1331, Naval Civil Engineering Lab, Port Hueneme,
NTIS Report AD-774 080. 35 p.

Described is an experimental investigation which determined the effectiveness of the Coanda-effect oil-water separator. Tests demonstrated that the separator reduced the oil content in an oil-water mixture from 6% to 1-3%.

Cleanup and recovery

Citation Source: Selected Water Resources Abstracts. 1974.
7(21). Entry # W74-11436.

C-687-74
COMPLETE INDUSTRIAL WASTE WATER REUSE GOAL OF REFINING STUDY

Porter, J. W., J. H. Blake, and R. T. Milligan. 1973.
Oil & Gas Journal 71(40):70-74.

The article discusses the problems that face the oil refineries in attaining waste water discharge standards to comply with the U.S. national goal of zero discharge of pollutants to the waterways by 1985.

National legislation

Citation Source: Environmental Health and Pollution Control.
1974. 6(1). Entry #633.

C-688-74
RPC DIVISION, MIDLAND-ROSS CORP. 10-GALLON-PER-MINUTE LIQUID/LIQUID SEPARATOR

Russell, E. C. 1973.
Report 2058, May, 1973. NTIS Report AD-763 154. 11 p.

The design and testing of a 10 gpm liquid/liquid separator as a shipboard oil pollution control device is described. Redesign of the separator may be required to insure complete oil separation at high oil injection rates.

Design and engineering

Citation Source: Selected Water Resources Abstracts. 1974.
7(23). Entry # W74-12009.

C-689-74
PROSPECTS FOR IMPROVING CIRCULATING WATER SUPPLY SYSTEMS OF PETROLEUM REFINERIES [English Translation]

Saifutdinov, K. Z., E. G. Ioakimis, and A. K. Efimova. 1974.
Khimiya Tekhnologiya Topliv i Masel 9:4-7.

A water supply and drainage system with complete return of industrial and sewer waste waters, which replaces 46% of the feed water with treated municipal sewage, is described.

Citation Source: Chemical Abstracts. 1974. 81(26).
Entry #176026z.

C-690-74

POSSIBLE FLOTATION SEPARATION OF THE DISPERSED PHASE FROM DILUTE OIL-WATER EMULSIONS [English Summary]

Skrylev, L. D., and V. A. Artemova. 1974.
Kolloidnyi Zhurnal 36(3):594-596.

A number of cationic surfactants are given which are suitable for the removal of motor oil, industrial lubricants, compressor oil, turbine oil or transformer oil from industrial effluents, when used in a flotation separation process.

Citation Source: Chemical Abstracts. 1975. 82(2).
Entry #5563p.

C-691-74

ROLE OF PROTOZOA IN THE BIOLOGICAL PURIFICATION OF PETROCHEMICAL INDUSTRY WASTE WATERS [English Summary]

Strom, A. D., I. P. Danilevskaya, I. F. Tikhonruk, G. D. Vasilenko, and V. V. Vitlinskaya. 1974.
Gidrobiologicheskii Zhurnal 10(2):49-54.

Petrochemical waste waters were passed through a biofilter and at flow rates of ~200 ml/hr, the COD of the purified water was 5 mg O/l.

Citation Source: Chemical Abstracts. 1974. 81(26).
Entry #175705h.

4. RESEARCH

C-692-74

ANALYSIS OF WATER CHARACTERISTICS OF MANUFACTURING INDUSTRIES AND THEIR ADAPTABILITY TO SEMI-ARID REGIONS

Ben-David, S., F. L. Brown, Jr., H. G. Folster, and E. F. Thode. 1974.
New Mexico Water Resources Research Institute, Las Cruces, Report 040, June, 1974. 155 p. NTIS Report PB-236-280.

The petroleum refining and coal gasification industries were selected for a study which examined the operating characteristics of these water-using industries and their technological ability to adapt to the economic and environmental conditions of the semi-arid Southwest.

Citation Source: Selected Water Resources Abstracts. 1974. 7(24). Entry # W74-12863.

C-693-74

ENVIRONMENTAL INFLUENCES ON OFFSHORE FACILITIES

Hull, A. R., and T. S. Austin. 1974.
Marine Technology Society Journal 8(4):15-21.

The article describes the services of the Environmental Data Service, NOAA, which are to provide environmental data in areas including oceanography and marine geology, and to work with individuals, industry and government agencies to conduct environmental studies to meet offshore development needs. The role of environmental data in the development of superports in the Gulf of Mexico is discussed.

Citation Source: Environment Abstracts. 1974. 4(11). Entry #12-74-09627.

C-694-74

EPA INDUSTRIAL POLLUTION CONTROL R AND D PROGRAM-PETROLEUM REFINING AND ORGANIC CHEMICALS INDUSTRIES

Lacy, W. J., P. E. Des Rosiers, L. Myers, and T. E. Short. 1974.
American Chemical Society, Division of Petroleum Chemistry, Preprint 19(3):516. (Meeting, Atlantic City, New Jersey, September 8-13, 1974).

The authors examine the research and development programs developed by the U.S. Environmental Protection Agency for water pollution control in the U.S. chemical industry.

Citation Source: The Engineering Index Monthly. 1975. 13(1). Entry #006866.

C-695-74
CARGO SPILL PROBABILITY ANALYSIS - A BAYESIAN APPROACH

Nair, K., H. C. Shah, and S. Wayne. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper, Houston, Texas, May 6-8, 1974. (1):435-447. Paper 1980.

A Bayesian statistical approach was used in the development of a probability method for predicting cargo spill occurrences. Probable size, location and cause of cargo spills can be predicted.

Citation Source: The Engineering Index Monthly. 1974. 12(11). Entry #074491.

C-696-74
EXPERIMENTAL QUALITY RESEARCH IN THE OCEAN SCIENCES DIVISION

Nekritz, R. 1973.
U.S. Naval Research Laboratory, Washington, D.C., Report of NRL Progress; November, 1973. p. 17-28.

Several projects of the Ocean Sciences Division are reviewed, including control of oil spills.

Citation Source: Oceanic Abstracts. 1975. 12(1). Entry #75-00684.

C-697-74
EMERGING OCEAN OIL AND MINING LAW

Wurfel, S. W. 1974.
North Carolina University Sea Grant Publication UNC-SG-74-02. 65 p.

Six research studies are presented in the report. Topics include: International Cooperation for the Control of Oil Pollution (G.E. Smith), International Regulation of Petroleum Exploration and Exploitation on the High Seas (J. A. Sanford Routh), and the North Carolina Oil Pollution Control Law; A Model for State Efforts to Curb Pollution of the Sea (J. V. Maxwell).

International legislation
State legislation

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(10). Entry E4Q11009M.

5. REGULATIONS, STANDARDS AND PLANNING

C-698-74
OIL SPILLS TROUBLE CANADIAN WATERS

Anon. 1974.
Water Newsletter 16(23):2.

Canada's Environment Minister reported that 8,500 gallons of oils are spilled each week in Canadian waters. Efforts are being made by the Environmental Ministry and the Ministry of Transportation to develop regulations and standards covering siting and operation of oil terminals and transportation of oil cargoes in Canadian waters.

Foreign legislation

Citation Source: Citation Journal.

C-699-74
WATER REGULATIONS--CRITERIA FOR STATE, LOCAL AND REGIONAL OIL REMOVAL CONTINGENCY PLANS

Anon. 1973.
Pollution Control Guide, Volume 2, Paragraph 8660-8686.
p. 9201-9203.

Guidelines are provided to assist state, local and regional agencies to develop oil removal contingency plans which would quickly and effectively minimize damage resulting from oil discharges.

Citation Source: Selected Water Resources Abstracts. 1975.
8(2). Entry # W75-00941.

C-700-74
CODES OF PRACTICE FOR DEALING WITH OIL SPILLS AT SEA AND ON SHORE: A EUROPEAN VIEW

Beynon, L. R. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 616-626.

The paper outlines the guidance codes prepared by various western European countries for dealing with oil spills of different oil types at sea and on shore locations. The codes are intended to assist industrial, local, or national agencies which may have to undertake oil cleanup operations.

Cleanup and recover

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13021G.

C-701-74
OIL SPILL CONTINGENCY PLANNING IN THE NORTH SEA

Daniels, J. T. 1973.
Journal of Petroleum Technology 25:1153-1154.

The joint efforts and plans of oil companies and offshore operating committees of North Sea countries for the prevention of oil pollution in North Sea waters are described. Present plans involve the use of oil-dispersing chemicals for oil spill cleanup.

Cleanup and recovery

Citation Source: Pollution Abstracts. 1975. 6(1).
Entry #75-00508.

C-702-74
SPILL RISK ANALYSIS PROGRAM. PHASE II. METHODOLOGY, DEVELOPMENT AND DEMONSTRATION

Dunn, W. A., and P. M. Tullier. 1974.
Report No. ORI-TR-840 USCG-D-15-75.

Methods to assess the effectiveness of merchant marine safety regulations are being developed primarily to assist Coast Guard regulatory decision-makers in selecting alternative means of reducing transport casualties and spills of oils and other pollutants.

Citation Source: Government Reports Announcements. 1974.
74(23). Entry #AD-785 026/6GA.

C-703-74
BASIC TRENDS IN THE IMPROVEMENT OF WATER SUPPLY DRAINAGE, AND WASTE WATER PURIFICATION SYSTEMS OF PETROLEUM REFINERIES [English Translation]

Eigenson, A. S., and E. G. Ioakimis. 1974.
Khimiya Tekhnologiya Topliv i Masel 9:7-10.

"Permissible concentrations of pollutants for the Soviet All-Union State Standard GOST project for waste waters from petroleum refineries and petrochemical plants are given."

Citation Source: Chemical Abstracts, 1974. 81(24).
Entry #138236p.

C-704-74
PROVINCES OF PROMISE

Emery, K. O. 1974.
Oceanus 17 (summer):15-19.

The paper summarizes the major oceanic oil fields and lists the factors which will influence the continuance of fossil oil and gas as major sources of fuel. Included among the determining factors are: the rate at which exploration of new ocean areas can be completed, and continued improvement in preventing oil spills.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q12270M.

C-705-74
WATER QUANTITY AND QUALITY MANAGEMENT IN THE RUHR VALLEY

Imhoff, K. R. 1974.
Journal of the Water Pollution Control Federation 46(7):1663-1673.

The roles of water associations which manage water quantity and quality in the Ruhr Valley, Germany, in such areas as waste water treatment, oil pollution measures, water reuse and research, are discussed.

Citation Source: Biological Abstracts. 1975. 59(1).
Entry #5142.

C-706-74
OIL AND HAZARDOUS SUBSTANCE POLLUTION CONTROL ON THE OPEN SEA

Pristoop, S. M. 1973.
In: Water for the Human Environment, Volume I, Congress Papers; Proceedings of the First World Congress on Water Resources, Chicago, Illinois, September 24-28, 1973. p. 400-425.

The paper lists recommendations made regarding necessary research and development activities leading to an effective oil spill pollution control and abatement system. Preliminary steps in the system's development include a thorough problem definition, description of the environment, determination of the fate of the pollutants in the environment, and risk analyses associated with a pollution event.

Research

Citation Source: Selected Water Resources Abstracts. 1975.
8(3). Entry # W75-01468.

E. EFFECTS OF OIL PROSPECTING AND PRODUCTION

1. BIOLOGICAL EFFECTS

C-707-74
REPORT TO THE CONGRESS ON OCEAN DUMPING AND OTHER MAN-INDUCED CHANGES TO OCEAN ECOSYSTEMS, OCTOBER 1972 THROUGH DECEMBER 1973. PUBLIC LAW 92-532, TITLE II

Anon. 1974.
Annual Report No. 1. NOAA-74060509. 108 p.

Included in the report on the problem of ocean dumping is information describing the effects of the development of offshore terminals and oil and gas development on the marine environment.

General effects of oil prospecting and production

Citation Source: Government Reports Announcements. 1974. 74(20). Entry # COM-74-50632/OGA.

C-708-74
BIOLOGICAL EFFECTS OF REFINERY EFFLUENTS

Baker, J. M. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 715-723.

Speed of dispersion and dilution of effluent in an ecosystem are major factors determining biological effects of refinery effluents. Behavioral responses or toxic effects may change species distributions and abundances. Sublethal effects are not yet known.

Biological effects of oil pollution

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13097M.

C-709-74
IMPROVEMENTS IN OIL AND GAS RECOVERY TECHNIQUES WITH PARTICULAR REFERENCE TO THE NORTH SEA AND THEIR IMPACT ON THE ENVIRONMENT

Baldwin, A. H., and E. B. Cowell. 1974.
Presented at 9th World Energy Conference, Detroit, September 22-27, 1974. p. 3.1-4. 24 p.

A review is given of the project to install oil drilling/production platforms and other facilities in a North Sea oilfield. The environmental safety and effects of such oil development activities are examined.

General effects of oil prospecting and production

Citation Source: Environment Abstracts. 1974. 4(11).
Entry #12-74-09648.

C-710-74

ENVIRONMENTAL IMPACT ANALYSIS: THE EXAMPLE OF THE PROPOSED TRANS-ALASKA PIPELINE

Brew, D. A. 1974.
Circular 695. 16 p.

The report describes the aspects considered in preparing the environmental impact analysis for the proposed trans-Alaska pipeline. The principal unavoidable effects included disturbance of terrain, fish, wildlife habitat and human environs, and the results of the discharge of tanker-ballast treatment effluent into Port Valdez.

Citation Source: Selected Water Resources Abstracts. 1974.
7(23). Entry # W74-12011.

C-711-74

WATER POLLUTION ASPECTS FROM WASTE DRILLING MUD DISPOSAL IN CANADA'S ARCTIC

Bryant, W. J., J. R. Goldburn, and J. R. Hurdley. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper, Houston, Texas, May 6-8, 1974. (2):95-106. Paper 2044.

The paper reports that water base muds and other waste fluids from oil drilling have caused acute toxicity to fish, high dissolved oxygen demand, high concentrations of organic carbon, total nitrogen, phosphorus, solids, chemical oxygen demand and chromium in Canada's waters. The need for development of waste treatment technology is emphasized.

Citation Source: The Engineering Index Monthly. 1974. 12(11).
Entry #071956.

C-712-74
BIOLOGICAL ASPECTS OF OIL POLLUTION IN THE MARINE ENVIRONMENT: A REVIEW (Enlarged Edition)

Butler, M. J. A., F. Berkes, and H. Powles. 1974.
Marine Sciences Centre Manuscript Report, McGill University, 22A. 133 p.

The object of the study was to analyze the environmental implications of several hypothetical incidents that would be associated with oil exploration, development, and marine transportation activities and facilities. The report was prepared as a background document for the oil pollution study conducted by McGill University, and supported by the Canadian Department of the Environment.

General effects of oil prospecting and production

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(11). Entry #4Q11899M.

C-713-74
A SURVEY OF THE ECONOMIC AND ENVIRONMENTAL ASPECTS OF AN ONSHORE DEEPWATER PORT AT GALVESTON, TEXAS. PART II. ENVIRONMENTAL

Hann, R. W., Jr., and W. P. James. 1974.
Texas A & M University Sea Grant Program TAMU-SG-74-214. 52 p.

The report outlines the environmental factors associated with the proposed deep channel from Pelican Island to a depth of 100 feet, 57 miles offshore in the Gulf of Mexico. The section presents ways in which the environmental components of such development, both beneficial and degradatory, should be evaluated.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(10). Entry #4Q10797M.

C-714-74
EFFECTS OF AN OFFSHORE CRUDE OIL UNLOADING TERMINAL ON THE MARINE ENVIRONMENT

James, W. P., R. W. Hann, Jr., and F. Slowey. 1975.
Marine Technology Society Journal 9(1):27-31.

The article discusses the studies undertaken at Texas A & M University on the environmental impact of a deepwater crude oil unloading terminal off the Texas coast. Results of the research relating to field sampling, impacts of terminal construction and operation, and the impact of a major oil spill on the environment are presented.

General effects of oil prospecting and production

Citation Source: Citation Journal.

C-715-74
POTENTIAL BIOLOGICAL EFFECTS OF HYPOTHETICAL OIL DISCHARGES IN THE ATLANTIC COAST AND GULF OF ALASKA

Moore, S. F., G. R. Chirlin, C. J. Puccia, and B. P. Schrader. 1974.
Massachusetts Institute of Technology Sea Grant Program Report MITSG 74-19. 204 p.

A study was initiated to analyze the primary biological effects of oil production and development on the Atlantic and Alaskan outer continental shelves. The effects of oil discharges from offshore platforms and large volume oil spills are assessed.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(10). Entry #4Q10762M.

C-716-74
NORTH SEA OIL: SCOTLAND'S SALVATION OR SLIDE TO A SEWER?

Stephenson, K. 1974.
Civil Engineering 810:48-51.

The environmental consequences that may arise as a result of Scotland's proposed plans for oil exploration and development are discussed.

General effects of prospecting and production

Citation Source: Environmental Health and Pollution Control. 1974. 6(1). Entry #381.

C-717-74
GEOGRAPHICAL ANALYSIS OF OIL SPILL POTENTIAL ASSOCIATED WITH ALASKAN OIL PRODUCTION AND TRANSPORTATION SYSTEMS

Swift, W. H., R. E. Brown, L. V. Kimmel, M. M. Orgill, and P. L. Petersen. 1974.
Contract DOT-CG-23223-A, AD-784099; USCG-D-79-74. NTIS Report CSCL 13/2. 273 p.

The report reviews the future development of petroleum production and transportation in Alaska, and estimates the degree of associated oil pollution in the Alaskan environment.

General effects of oil prospecting and production

Citation Source: Scientific and Technical Aerospace Reports. 1975. 13(2). Entry #N75-11543.

2. PHYSICAL EFFECTS

C-718-74
PRELIMINARY, PHYSICAL IMPACTS OF OFFSHORE PETROLEUM DEVELOPMENTS

M.I.T. 1974.
Massachusetts Institute of Technology Sea Grant Publication
MITSG 74-20. 443 p.

Four studies are presented in the report dealing with the initial physical effects of offshore oil development on the Atlantic and Gulf of Alaska continental shelves. The topics include: number of platforms and types of oil transport that would be needed, the probability of oil spills and spill volume determination, expected oil spill trajectories for the areas, diffusion and evaporation processes during weathering of oil slicks.

Physical changes of oil in the environment

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(10). Entry #4Q10719.

3. ECONOMIC EFFECTS

C-719-74
OIL'S ENVIRONMENT OUTLAY NEAR $6 BILLION

Anon. 1974.
Oil & Gas Journal 72(46):34.

The American Petroleum Institute reported at its annual meeting that the petroleum industry has spent more than $5.5 billion for environmental protection over the last 8 years. Projects to prevent water pollution received $2.265 billion, or more than 41% of all funds.

Citation Source: Citation Journal.

C-720-74
DEVELOPMENTS IN PETROLEUM TRANSPORT BY SEA

Lescohier, R. P. 1974.
Presented at 9th World Energy Conference, Detroit, September 22-27, 1974. p. 5.1-14. 25 p.

Discussed are the changes which have arisen as a result of the great increase in sea transportation of petroleum, including reduction in operating costs, improved safety and reduction of pollution of the seas.

Biological effects of oil prospecting and production

Citation Source: Environment Abstracts. 1974. 4(11).
Entry #12-74-09651.

C-721-74
THE IMPACT OF OFFSHORE OIL PRODUCTION ON SANTA BARBARA COUNTY, CALIFORNIA

Wilcox, S. M., and W. J. Mead. 1974.
Government Reports Announcements 74(7):119. Contract NOAA 2-35208 (Ref. Order No. COM-74-10264/1GA).

The impact of oil production on the economy of Santa Barbara County is evaluated. Information on environmental changes due to oil production and spills is included.

General effects of oil prospecting and production

Citation Source: Oceanic Abstracts. 1975. 12(1).
Entry #75-01000.

4. GENERAL EFFECTS

C-722-74
(Science Concentrate)

Anon. 1975.
Chemical & Engineering News 53(5):16.

The effect of oil shale development on water quality and quantity in Colorado's Piceance Basin is reviewed.

Citation Source: Citation Journal.

C-723-74
PROPOSED EXPANSION OF FOREIGN-TRADE SUBZONE 9A (HIRI OIL REFINERY), HONOLULU, HAWAII

Anon. 1974.
Final Environmental Impact Statement OEA-74-2. 297 p.

The report assesses the environmental impact of the proposed expansion of the Hawaii Independent Refinery to a daily capacity of 125,000 barrels/day.

Citation Source: Government Reports Announcements. 1974. 74(17).
Entry # COM-74-11071/9GA.

C-7424-74
THE OIL INDUSTRY AND THE ENVIRONMENT

Chandler, G. 1974.
Petroleum Review 23(326):85-92.

Part II of a paper presented at the Conference on Fuel and the Environment deals with marine transportation and refining in respect to environmental protection. Topics of accidental spillage and cleanup cost (oil transportation) and effluent emmissions control (refining) are discussed.

Cleanup and recovery

Citation Source: Environmental Health and Pollution Control.
1974. 6(1). Entry #494.

C-725-74
ENERGY AND THE ENVIRONMENT

Fri, R. W. 1973.
American Lung Association Bulletin 59(10):2-6.

The former acting administrator of the American Lung Association outlines the difficult problems of developing energy resources while concurrently protecting the environment.

Biological effects of oil prospecting and production

Citation Source: Abstracts on Health Effects of Environmental Pollutants. 1974. 3(12). Entry #11268.

C-726-74
LAW OF THE SEA: THE EMERGING REGIME OF THE OCEANS

Gamble, J. K., Jr., and G. Pontecorvo. 1974.
NTIS Report COM-74-10846/5WP. 390 p.

Superport development, offshore petroleum, merchant ships and marine pollution are included among the topics of maritime law discussed in the report.

International legislation

Citation Source: Environment Abstracts. 1974. 4(12). Entry #12-74-10241.

C-727-74
SEA PROTECTION AGAINST CONTAMINATION WITH OIL-CONTAINING WASTE WATER

Gasanov, M. V., R. G. Mamedov, and G. B. Babaev. 1973.
In: Water for the Human Environment, Volume I, Congress Papers; Proceedings of the First World Congress on Water Resources, Chicago, Illinois, September 24-28, 1973. p. 383-390.

Waters from oil fields were found to contaminate the Caspian Sea during oil prospecting, drilling, and transporting activities. Mechanical and biochemical treatments of oil sewage from oil production and domestic wastes are discussed.

Waste water treatment

Citation Source: Selected Water Resources Abstracts. 1975. 8(3). Entry # W75-01466.

C-728-74
THE OILMEN COMETH

Graham, F., Jr. 1975.
Audubon 76(2):96-97.

The article discusses the interest of the Pittston Company in constructing a $350 million deepwater terminal and refinery in Eastport, Maine; and the environmental concern of the people of Maine regarding such development.

Citation Source: Citation Journal.

C-729-74
OCS OIL: MAMMOTH LEASE PLAN ENCOUNTERS HEAVY OPPOSITION

Holden, C. 1974.
Science 186(4164):610-615.

The political-environmental battle arising from the Department of Interior's plans to embark on a vast new leasing program in the outer continental shelf is discussed. The environmental, economic and social issues involved in accelerated OCS leasing are reviewed.

Citation Source: Citation Journal.

C-730-74
OFFSHORE OIL IN SOUTHEAST ASIAN WATERS: POTENTIAL ENVIRONMENTAL PROBLEMS

Marshall, A. G. 1974.
Environmental Conservation 1(1):69-70.

The existing energy crisis has led to increased development of offshore oil resources in Southeast Asia. The article states that an environmentalist lobby should be formed to prevent legislatures from overlooking the well-being of the environment in the areas of development. A six-point marine protection policy is outlined.

Biological effects of oil prospecting and production

Citation Source: Environment Abstracts. 1974. 4(12).
Entry #12-74-10201.

C-731-74
POLLUTION PROBLEMS AND RESEARCH NEEDS FOR AN OIL SHALE INDUSTRY

Pfeffer, F. M. 1974.
Environmental Protection Agency, Technology Series, Report EPA-660/2-74-067. GOP Sup. Doc. EP1.23:660/2-74-067. 36 p.

Descriptions of oil shale resources and surface drainage within the Green River Formation are included in the review of pollution problems and research needs of the oil shale industry. The stabilization of spent shale residues derived from oil shale retorting processes are discussed, along with other areas of environmental concern.

Citation Source: Selected Water Resources Abstracts. 1975. 8(1). Entry # W75-00012.

C-732-74
THE DISPOSAL AND ENVIRONMENTAL EFFECTS OF CARBONACEOUS SOLID WASTES FROM COMMERCIAL OIL SHALE OPERATIONS

Schmidt-Collerus, J. J. 1974.
Government Reports Announcements 74(13):77.

Samples of soil, water, vegetation and air from various areas of potential oil shale operations and samples of carbonaceous spent shale from retorting in pilot plants were analyzed for polycyclic organic matter content. The samples were analyzed in an effort to investigate the potential impact from trace organic matter from carbonaceous spent shale on the environment.

Citation Source: Pollution Abstracts. 1975. 6(1). Entry #75-00920.

C-733-74
OIL SHALE DEVELOPMENT AND ITS ENVIRONMENTAL CONSIDERATIONS

Stone, R. T. 1974.
American Chemical Society, Division of Petroleum Chemistry, Preprint 19(3):510. (Meeting, Atlantic City, New Jersey, September 8-13, 1974)

The paper outlines the programs and activities involved in oil shale development by the United States, and the environmental concerns which have been investigated.

Citation Source: The Engineering Index Monthly. 1975. 13(1). Entry #004252.

F. FATE OF OIL IN THE ENVIRONMENT

1. BIOLOGICAL DEGRADATION

C-734-74
INVESTIGATION OF THE BEHAVIOR AND EFFECTS OF OIL UTILIZING A MANNED UNDERWATER HABITAT

Allen, A. A., R. S. Schlueter, and L. E. Fausak. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper, Houston, Texas, May 6-8, 1974. (1):425-434. Paper 1979.

In an effort to understand subsurface effects of oil, the behavior and effects of several oils in the subsurface marine environment were studied mainly by divers working from an underwater habitat located off Freeport, Grand Bahama Island. Sinking agent effectiveness and oil degradation, solubility and migration through the bottom sediments were investigated.

Chemical changes
Physical changes

Citation Source: The Engineering Index Monthly. 1974. 12(11). Entry #074301.

C-735-74
FATE AND EFFECTS OF OIL POLLUTANTS IN EXTREMELY COLD ENVIRONMENTS

Atlas, R. M. 1973.
Final Report to Office of Naval Research, October, 1973. ONR Contract NAS7-100. 34 p.

Results of studies examining the interactions of microorganisms and Prudhoe crude oil at study sites in Prudhoe Bay, Valdez, Umiat, and Cape Simpson, Alaska are described. In an experiment with floating miniature oil slicks contained in Prudhoe Bay for a period of 5 weeks, natural losses of oil, including biodegradation, were 60%; and stimulated losses, in which bacterial populations were added, amounted to 80% of the added oil by weight.

Citation Source: Selected Water Resources Abstracts. 1974. 7(22). Entry # W74-11725.

C-736-74
MICROORGANISMS CAPABLE OF DEGRADING REFRACTORY HYDROCARBONS IN OHIO WATERS

Cooney, J. J. 1974.
Ohio Water Resources Center, Columbus, Completion Report, No. 443X. OWRT A-029-Ohio (1). 14-31-0001-4035. NTIS Report PB-237 293. 39 p.

Studies were undertaken in which samples were collected from four freshwater ecosystems in Ohio to determine the hydrocarbon content, total bacterial and fungal populations, and the numbers of hydrocarbon utilizing bacteria, yeasts and fungi present. Data from the measurements suggested that a high content of aromatic and/or olefinic hydrocarbons may be toxic to the microbial flora, and that there is a direct relationship between the amount of hydrocarbons and the number of hydrocarbon-using microorganisms in the lake sediments.

Citation Source: Selected Water Resources Abstracts. 1975.
8(2). Entry # W75-00977.

C-737-74
THE BIODEGRADATION OF HYDROCARBONS [English Summary]

Fasoli, U., and G. Genon. 1974.
La Chimica e L'Industria 56(3):191-195.

"Two distinct mathematical models based on Monod's growth equation, are given for the interpretation of experimental results relating to hydrocarbon biodegradation." A comparison is made between the two models, and their possible applications are discussed.

Citation Source: Selected Water Resources Abstracts. 1974.
7(24). Entry # W74-13300.

C-738-74
BIODEGRADATION OF HYDROCARBONS IN THE SEA

Floodgate, G. D. 1972.
In: Water Pollution Microbiology. R. Mitchell (Editor), Wiley, New York, New York. p. 153-171.

The origin of oils and hydrocarbons in the sea and their bacterial breakdown are reviewed.

Citation Source: Chemical Abstracts. 1975. 82(4).
Entry #21497a.

C-739-74
DISPOSAL OF OIL WASTES BY MICROBIAL ASSIMILATION

Francke, H. C., and F. E. Clark. 1974.
Report Y-1934. 45 p.

A biological assimilatory process has been developed for the successful disposal of industrial plant oil waste products.

Waste petroleum products are mixed into the soil where natural microbial assimilation degrades the oily wastes.

Citation Source: Chemical Abstracts. 1974. 81(26).
Entry #175760x.

C-740-74
THE MICROBIAL DEGRADATION OF AROMATIC PETROLEUM PRODUCTS

Gibson, D. T. 1974.
Annual Report No. 16-1938-1. Contract N00014-67-A-0126-0020.
70 p.

The contract provides for the investigation of mechanisms used by soil bacteria in oxidizing ortho-, meta-, and para-xylene. Significant accomplishments are described in the progress report.

Citation Source: Government Reports Announcements. 1974.
74(18). Entry #AD 781 709/1GA.

C-741-74
MICROBIAL DEGRADATION OF HIGH-MOLECULAR-WEIGHT ALKANES

Haines, J. R., and M. Alexander. 1974.
Applied Microbiology 28(6):1084-1085.

A study was conducted to determine whether high molecular weight hydrocarbons are degraded when provided to microorganisms. Measurements of biological oxygen demand show that, in vitro, the microflora are able to destroy normal alkanes of higher molecular weight than heretofore believed.

Citation Source: Citation Journal.

C-742-74
MICROBIAL DEGRADATION OF PETROLEUM IN CONTINENTAL SHELF SEDIMENTS

Hunt, P. G., F. R. Koutz, R. P. Murrmann, and T. G. Martin. 1973.
U.S. Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire. Special Report No. 196. 20 p.

In studying the degradation rate of petroleum wastes in continental shelf surface sediments under aerobic conditions, it has been estimated that complete degradation would require several hundred years. The slow rate of decomposition in continental shelf sediments is due to the low O_2 conditions created by the high O_2 demand of the wastes.

Citation Source: Pollution Abstracts. 1975. 6(1).
Entry #75-00305.

C-743-74
EFFECT OF AMENDMENTS ON THE MICROBIAL UTILIZATION OF OIL APPLIED TO SOIL

Jobson, A., M. McLaughlin, F. D. Cook, and D. W. S. Westlake.
1974.
Applied Microbiology 27(1):166-171.

In a study treating replicate field plots with oil, oil and bacteria, oil and fertilizer, and oil, bacteria and fertilizer, it was found that after a period of 308 days, the application of fertilizer resulted in stimulated bacterial numbers and rates of n-alkane component utilization. Application of oil-utilizing bacteria only slightly accelerated the rate of utilization of n-alkane components of chain lengths C_{20}-C_{25}.

Citation Source: Pollution Abstracts. 1975. 6(1).
Entry #75-00948.

C-744-74
POLLUTION AND SELF-PURIFICATION OF MARINE SOILS [English Summary]

Kiryukhina, L. N., M. I. Kucherenko, and O. G. Mironov. 1974.
Gidrobiologicheskii Zhurnal 10(2):55-59.

In a frequently oil-polluted bay, bottom sediments were found to contain 1 x 10^4 oil-consuming bacteria/g. Concentrations of such bacteria were 100-fold lower outside the bay. "Repeated pollution of the surface created redn zones in the sediments and led to predominance of bituminization over humification."

Citation Source: Chemical Abstracts. 1975. 82(2).
Entry #7502s.

C-745-74
ANAEROBIC DEGRADATION OF ALKANES BY MICROORGANISMS

Mahadevan, A. 1974.
Journal of Scientific and Industrial Research 33(1):39-43.

A review and discussion of the subject of anaerobic degradation of alkanes are given. Alkane oxidation and microbial activity in petroleum formations are emphasized.

Citation Source: Chemical Abstracts. 1974. 81(25).
Entry #165920k.

C-746-74
PROPERTIES OF SABLE ISLAND CRUDE OIL IN RELATION TO ITS BEHAVIOR IN THE EVENT OF A SPILL AT SEA

McLean, A. Y., and D. A. Odedra. 1974.
Offshore Technology Conference, 6th Annual, Preprint of Paper, Houston, Texas, May 6-8, 1974. (1):449-460. Paper 1981.

Research was conducted to characterize crude oil found on Sable Island, Nova Scotia, in an effort to predict the behavior of this oil if it were spilled at sea. The effects of various weathering processes on the oil (biodegradation, evaporation, emulsification) were studied.

Physical changes of oil in the environment

Citation Source: The Engineering Index Monthly. 1974. 12(11). Entry #074492.

C-747-74
EFFECT OF ENVIRONMENTAL PARAMETERS ON BACTERIAL DEGRADATION OF BUNKER C OIL, CRUDE OILS, AND HYDROCARBONS

Mulkins-Phillips, G. J., and J. E. Stewart. 1974.
Applied Microbiology 28(6):915-922.

A study was initiated to determine the action of microbial cultures on the degradation of Bunker C oil, and to assess the effect of nutrient levels on the rate of microbial growth on hydrocarbon substrates. The results suggest that the rate of biodegradation of oil in marine temperate-to-polar zones is limited to low temperatures and phosphorus concentrations, but naturally occurring nitrogen concentrations are probably not rate-limiting factors.

Citation Source: Citation Journal.

C-748-74
EFFECT OF FOUR DISPERSANTS ON BIODEGRADATION AND GROWTH OF BACTERIA ON CRUDE OIL

Mulkins-Phillips, G. J., and J. E. Stewart. 1974.
Applied Microbiology 28(4):547-552.

The report focuses on studies which examined four chemical dispersants in combination with Arabian crude oil to determine their effects on the growth of bacteria from local waters, bacterial population composition, and crude oil biodegradation. None of the dispersants used alone were toxic even at high concentrations.

Citation Source: Citation Journal.

C-749-74
HYDROCARBON METABOLISM BY BREVIBACTERIUM ERYTHROGENES: NORMAL AND BRANCHED ALKANES

Pirnik, M. P., R. M. Atlas, and R. Bartha. 1974.
Journal of Bacteriology 119(3):868-878.

The paper describes the 2 distinct chemical pathways by which branched- and straight-chain alkanes are metabolized by B. erythrogenes.

Citation Source: Biological Abstracts. 1974. 58(12).
Entry #68574.

C-750-74
DEEP-SEA BACTERIA: GROWTH AND UTILIZATION OF HYDROCARBONS AT AMBIENT AND IN SITU PRESSURE

Schwarz, J. R., J. D. Walker, and R. R. Colwell. 1974.
Applied Microbiology 28(6):982-986.

The study was undertaken to investigate microbial degradation of hydrocarbons under simulated deep-sea pressures. Microorganisms collected from Atlantic Ocean sediment samples at a depth of 4,490 m utilized hydrocarbons at both ambient and in situ pressures; however, at ambient temperature, the rate of hydrocarbon utilization under in situ pressure (500 atm) was significantly less than utilization at ambient pressure (1 atm).

Citation Source: Citation Journal.

C-751-74
DEGRADATION OF PETROLEUM HYDROCARBONS BY MARINE BACTERIA

Soli, G. 1973.
Proceedings of the 5th International Colloquium of Medical Oceanography, Messina, October 4-7, 1971. S. Genovese (editor), Messina, Italy. p. 251-258.

Hydrocarbon-degrading bacteria, isolated from coastal Southern California, were found to digest up to 75% of crude oil in a short time period when furnished with necessary metabolites (P, oils, N). The author emphasizes the need for further studies on environmental conditions which determine effective hydrocarbon oxidation, since the role of these bacteria in the self purification process of oil contaminated waters may be significant.

Cleanup and recovery

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(9). Entry #4Q9557M.

C-752-74
MICROBIAL ECOLOGY OF PETROLEUM UTILIZATION IN CHESAPEAKE BAY

Walker, J. D., and R. R. Colwell. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 685-690.

Studies were conducted on petroleum-degrading microorganisms collected at 2 stations in Chesapeake Bay; one station demonstrated 4-5 times the concentration in water of petroleum compared to the second station. The numbers of oil-degrading microorganisms were related to the concentration of oil in each water sample analyzed. The hydrocarbon-utilizing fungus, Cladosporium resinae, and actinomycetes comprised a large number of the hydrocarbon-degrading isolates.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q12305M.

C-753-74
MICROBIAL PETROLEUM DEGRADATION: USE OF MIXED HYDROCARBON SUBSTRATES

Walker, J. D., and R. R. Colwell. 1974.
Applied Microbiology 27(6):1053-1060.

A comparison is made of the methods for estimating the microbial degradation of petroleum. Gas-liquid chromatography with a mixed hydrocarbon substrate has been demonstrated to be a useful method for evaluating the microbial potential of hydrocarbon degradation.

Analysis

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(10). Entry #4Q10779M.

C-754-74
ACTIVITY OF OIL OXIDIZING BACTERIA ISOLATED FROM THE WATER OF LAGOON OF KURSKI ZALIV AND THE BALTIC SEA COAST [English Summary]

Yabkyavichyus, K. K., L. K. Yankyavichyus, and B. A. Malamene. 1973.
Lietuvos Tsr Moksiu Akademijos Darbai Serija C Biol Mokslai 4:21-27.

Studies of oil-oxidizing bacteria from these bodies of water revealed that bacteria isolated from the sea grew better on media with diesel oil, autol and mazut than those isolated from the lagoon. Mixtures of oil-consuming bacteria appeared to assimilate diesel oil and autol on a nonsterile medium better than on a sterile medium.

Citation Source: Biological Abstracts. 1975. 59(1).
Entry #4540.

2. CHEMICAL CHANGES

C-755-74
THE FATE OF A BUNKER FUEL IN BEACH SAND

Guard, H. E., and A. B. Cobet. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 827-834.

Research conducted on oil dispersed on three San Francisco beaches showed that beaches disperse the oil, enhancing the effect of dissolution on the fuel composition. Lower molecular weight fractions are removed.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974. 4(12). Entry #4Q13063M.

C-756-74
DISSOLUTION OF PETROLEUM-DERIVED PRODUCTS IN WATER

Lysyj, I., and E. C. Russell. 1974.
Water Research 8(11):863-868.

Several lubricating oils and fuels were studied in experiments to determine the factors involved in the transfer of organic materials from an oil film into an aqueous solution. It was discovered that substantial quantities of organic matter can enter into solution as a result of contact between the oil film and the water. The rate of oil film dissolution is probably related to chemical changes in the oil film composition.

Analysis

Citation Source: Citation Journal.

C-757-74
SUN, OUR ALLY IN THE FIGHT AGAINST POLLUTION

Philpel, N. 1974.
Chimia 28(5):261-262.

The paper discusses the role of sunlight in accelerating the dispersion and decomposition of oil spills on seawater. UV radiation reacts with light-sensitive compounds on crude oil and oxidizes them to soluble or volatile products.

Citation Source: Chemical Abstracts. 1974. 81(22). Entry #140268r.

C-758-74

DEGRADATION OF BUNKER C OIL UNDER DIFFERENT COASTAL ENVIRONMENTS OF CHEDABUCTO BAY, NOVA SCOTIA

Rashid, M. A. 1974.
Estuarine & Coastal Marine Science 2(2):137-144.

The chemical and physical changes occurring in Bunker C oil remaining on the shores of Chedabucto Bay for a period of 3-1/2 years have been examined and described. Degradation of oil was found to be rapid in the high energy coastal environments, and relatively slow in protected areas. Residual oils present on the oil polluted beaches were predicted to persist for several years.

Physical changes of oil in the environment

Citation Source: Environment Abstracts. 1975. 5(1).
Entry #12-75-00646.

3. PHYSICAL CHANGES

C-759-74
PHOTO-OXIDATION AS A FACTOR IN THE ENVIRONMENTAL DISPERSAL OF CRUDE OIL

Burwood, R., and G. C. Speers. 1974.
Estuarine & Coastal Marine Science 2(2):117-135.

A review is given on the fate and dispersion processes of crude oil in the marine environment. Results of studies examining the equilibration of Middle East crude oil with seawater are discussed.

Citation Source: Environment Abstracts. 1975. 5(1).
Entry #12-75-00645.

C-760-74
FACTORS GOVERNING THE FATE OF OIL AT SEA; VARIATIONS IN THE AMOUNTS AND TYPES OF DISSOLVED OR DISPERSED MATERIALS DURING THE WEATHERING PROCESS

Frankenfeld, J. W. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 485-495.

Investigations have been conducted on some of the factors influencing the amounts and types of compounds found in water extracts from several crude and refined oils. Effects of oxidation and characteristics of the original oil appear to be the most important factors.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13058M.

C-761-74
WEATHERING OF OIL AT SEA

Frankenfeld, J. W. 1973.
Final Report, USCG-D-7-75, Contract DOT-CG-23035-A. 194 p.

The weathering of six carefully selected oils was monitored under controlled laboratory conditions in a study designed to trace the fate of petroleum products in the marine environment. The physical and chemical changes in the oils were measured with time of weathering.

Chemical changes of oil in the environment

Citation Source: Government Reports Announcements. 1974.
74(26). Entry #AD-787 789/7GA.

C-762-74

WIND DRIFT SURFACE CURRENTS AND SPREAD OF CONTAMINANTS IN SHELF WATERS

Gordon, A. L., and R. D. Gerard. 1973.
Final Report, No. USCG-D-75, Contract DOT-CG-23339-A. 65 p.

Oil spilt on the sea responds to the basic velocity field of the upper few meters of water. In an effort to better understand the fate and behavior of oil pollution, experiments were conducted from July, 1972 to February, 1973, in which the velocity field in the upper few meters of the water column in the area of Ambrose Tower was studied. Methods used in the experiments are given.

Citation Source: Government Reports Announcements. 1974.
7(25). Entry #AD-786 610/6GA.

C-763-74

EVAPORATION OF PETROLEUM OIL FILMS

Hirano, F., and T. Sakai. 1974.
Junkatsu 19(8):577-585.

The effects of various chemical constituents and various distributions of molecular weights on the evaporation and maximum diameter of spreading films of petroleum oils were investigated. The lifetime of the film increases with increasing molecular weight and with a larger range of molecular weights.

Citation Source: Chemical Abstracts. 1975. 82(8).
Entry #46049u.

C-764-74

BEHAVIORAL CHARACTERISTICS AND CLEANUP TECHNIQUES OF NORTH SLOPE CRUDE OIL IN AN ARCTIC WINTER ENVIRONMENT

McMinn, T. J., and P. Golden. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C., 4172. p. 263-276.

The authors discuss the physical fate and behavior of crude oil when spilled on winter arctic ice and snow, based on a series of experiments performed by the Coast Guard in the Alaskan Arctic during January-February, 1972.

Citation Source: Aquatic Sciences & Fisheries Abstracts. 1974.
4(12). Entry #4Q13054G.

C-765-74
AEROBIC DECOMPOSITION OF OIL POLLUTANTS IN SEDIMENTS

Shelton, T. B., and J. V. Hunter. 1974.
Journal of the Water Pollution Control Federation 46(9):2172-2182.

An investigation was conducted in which bottom sediments containing oil were placed on a continuous flow experimental system and the decomposition process was observed for 33 weeks. Results indicated a steady release of organic carbon from the sediments and loss of oil with time.

Citation Source: The Engineering Index Monthly. 1974. 12(11).
Entry #074489.

4. GENERAL FATE OF OIL

C-766-74
BACKGROUND PAPERS FOR A WORKSHOP ON INPUTS, FATES, AND EFFECTS OF PETROLEUM IN THE MARINE ENVIRONMENT

Anon. 1973.
2 Volumes, Washington, D.C.: National Academy of Sciences. 836 p.

The collection of papers contains various topics concerning petroleum in the marine environment, including its input into the seas, the fate of petroleum, chemical and biological analytical techniques, and the effects of petroleum on coastlines, biota, marine resources and human health.

Biological effects of oil pollution
Analysis

Citation Source: Pollution Abstracts. 1975. 6(1).
Entry #75-00630.

C-767-74
AGING OF CRUDE PETROLEUM ON WATER [English Summary]

Hellman, H. 1974.
Erdoel und Kohle-Erdgas-Petrochemie 27(8):422-425.

The aging of four different crude oils was examined and evaluated with the aid of flow curves. Results indicated that the weathering process depends on the type of oil and is reproducible.

Citation Source: The Engineering Index Monthly. 1974. 12(11).
Entry #074501.

C-768-74
POSSIBLE FATE OF OIL IN THE ARCTIC BASIN

Ramseier, R. O. 1973.
In: Water for the Human Environment, Volume I, Congress Papers; Proceedings of the First World Congress on Water Resources, Chicago, Illinois, September 24-28, 1973. p. 58-70.

The potential fate of oil after an oil spill in the Arctic basin is discussed, including its entrapment under the ice cover and the path of movement of oil with the ice.

Citation Source: Selected Water Resources Abstracts. 1975.
8(3). Entry # W75-01433.

G. OIL POLLUTION LEGISLATION

1. STATE LEGISLATION

C-769-74
OFFSHORE OIL DRILLING: A COMPARISON OF STATE LAWS

Geil, J. M. 1973.
Sea Grant Publication, UNC-SG-73-01. p. 138-146.

A comparison is made of the ways in which several states concerned with petroleum exploration have dealt with offshore oil drilling legislation. The major problems arising from oil exploration and the different systems of ownership of underwater oil are reviewed.

Citation Source: Selected Water Resources Abstracts. 1975.
8(2). Entry # W75-00803.

2. NATIONAL LEGISLATION

C-770-74
U.S. SUPERPORT PLANS ADVANCING

Anderson, E. V. 1975.
Chemical and Engineering News 53(4):10-11.

Discussed are the governmental plans and the surrounding controversies involved with the implementation of the new Deepwater Port Act of 1974. Included in the legislation is the clause which gives states the right to veto a superport project if they can establish that the state would be adversely affected by such development.

Citation Source: Citation Journal.

C-771-74
DEEPWATER PORTS

Anon. 1973.
Hearings--Subcommittee on Water Resources and Subcommittee on Energy, Committee on Public Works, U.S. House of Representatives, 93rd Congress, 1st Session, October 9-11, 1973.

The amendment to the Rivers and Harbors Act of 1975 establishes a Federal licensing program for the regulation of construction and operation of deepwater ports which are principally used for unloading oil between deepwater vessels and the United States, and are over three nautical miles from the U.S. coast. Economic and environmental advantages were included among the topics considered in the hearings.

Regulations, standards and planning

Citation Source: Selected Water Resources Abstracts. 1974.
7(23). Entry # W74-12262.

C-772-74
FIGHTING POLLUTION: LATEST GOVERNMENT ACTION IS AIMED AT REDUCING OIL SPILLS AND DISCHARGES

Anon. 1974.
Marine Engineering Log 79:29-33, 116, 118.

A review of the recent government efforts to prevent oil discharges and spills is given. Two lists of manufacturers and distributors of systems to separate oil from water for shipboard use, and of equipment and materials for containing, recovering and treating oil spills are included.

Cleanup and recovery

Citation Source: Citation Journal.

C-773-74
OIL POLLUTION REGULATIONS

Anon. 1973.
Work Boat 30(7):23.

The article reviews the oil pollution prevention regulations issued by the U.S. Coast Guard in the Federal Register on December 21, 1972. The regulations deal with oil transfer between vessels and terminals, and the operation of vessels on the U.S. navigable waters and contiguous zone after June 30, 1974.

Regulations, standards and planning

Citation Source: Pollution Abstracts. 1975. 6(1).
Entry #75-00311.

C-774-74
WATER REGULATIONS--DISCHARGE OF OIL

Anon. 1973.
Pollution Control Guide, Volume 2, Paragraph 8690-8699.
p. 9211-9212.

Legislation applying to oil discharges in U.S. waters is reviewed.

Citation Source: Selected Water Resources Abstracts. 1975.
8(2). Entry # W75-00942.

C-775-74
AMERICAN WATERWAYS: FLORIDA OIL POLLUTION LEGISLATION MAKES IT OVER FIRST HURDLE

Swan, P. N. 1973.
Journal of Maritime Law and Commerce 5(1):77-110.

The Supreme Court's decision making valid the 1970 Oil Spill Prevention and Pollution Control Act and upholding Florida's right to impose liability for suffered losses is described. Other federal-state conflicts arising from this legislation are examined.

Citation Source: Oceanic Abstracts. 1974. 11(6).
Entry #74-05928.

3. INTERNATIONAL LEGISLATION

C-776-74

Anon. 1974.
House of Representatives Report No. 692, Committee on Merchant Marine and Fisheries, 93rd Congress, 1st Session. 43 p.

The High Seas Oil Port Act amends the Merchant Marine Act of 1936 and authorizes the Secretary of Commerce to issue permits for the construction and operation of offshore port facilities. The Act is designed to minimize adverse environmental effects resulting from oil port development.

Biological effects of oil prospecting and production

Citation Source: Selected Water Resources Abstracts. 1974.
7(23). Entry # W74-12615.

C-777-74
IMCO - SECRETARIAT'S DRAFT RESOLUTIONS FOR SUBMISSION TO THE INTERNATIONAL CONFERENCE ON MARINE POLLUTION, 1973 ON THE SUBJECT OF PREVENTION AND CONTROL OF MARINE POLLUTION

Anon. 1973.
Journal of Maritime Law and Commerce 5(1):151-156.

Draft resolutions are presented by IMCO, dealing with implementation of the 1969 amendments to the International Convention for the Prevention of Pollution of the Sea by Oil, and the carriage and discharge of toxic substances other than oil.

Citation Source: Pollution Abstracts. 1975. 6(1).
Entry #75-00381.

C-778-74
OIL SPILLS: HOW SERIOUS A PROBLEM

Anon. 1973.
Journal of the Water Pollution Control Federation 45(4):583-585.

The article discusses the opposing views concerning the seriousness of oil spills, as presented at the Conference on the Prevention and Control of Oil Spills. Also discussed is the launching of a national program for oil spill control, which will include regulations setting requirements for spill reporting and contingency planning and legislation to enforce the regulations.

Citation Source: Selected Water Resources Abstracts. 1974.
7(23). Entry # W74-12621.

C-779-74
A SHORT CRUISE ON THE GOOD SHIPS TOVALOP AND CRISTAL

Becker, G. L. 1974.
Journal of Maritime Law and Commerce 5(4):609-632.

Tovalop and Cristal, two industry agreements relating to liability for oil pollution cleanup and damage, are compared to two international agreements. The performance of the industry agreements is evaluated.

Citation Source: Oceanic Abstracts. 1975. 12(1).
Entry #75-00973.

4. FOREIGN LEGISLATION

C-780-74
PETROLEUM REFINERY EFFLUENT REGULATIONS AND GUIDELINES

Anon. 1974.
Regulations, Codes and Protocols, Report EPS 1-WP-74-1. 28 p.

Controls have been issued by the Canadian government which ensure that all oil refineries operating in Canada apply the best possible treatment technology to their liquid effluents. The purpose of the regulations is to protect fish and marine resources from the effects of toxic refinery discharges.

Regulations, standards and planning

Citation Source: Pollution Abstracts. 1975. 6(1).
Entry # 75-00171.

C-781-74
NO FAULT LIABILITY FOR OIL POLLUTION DAMAGE

Bergman, S. 1973.
Journal of Maritime Law and Commerce 5(1):1-50.

Oil pollution problems, extent of marine oil pollution and the capacity to deal with oil spills are described,and current and past legislation regarding accidental pollution is evaluated. Absolute liability is proposed as a solution to oil spills and support for its feasibility is outlined.

Citation Source: Oceanic Abstracts. 1974. 11(6).
Entry #74-05926.

C-782-74
THE OIL INDUSTRY AND THE ENVIRONMENT

Chandler, G. 1974.
Petroleum Review (London) 28(325):22-27.

The article, which is the first part in a series of three presented by the author at the Conference on Fuel and the Environment, Eastbourne, England, November, 1973, discusses government legislation, platform and pipeline safeguards, and oil spill cleanup in respect to oil exploration and production.

General effects of oil prospecting and production
Cleanup and recovery

Citation Source: Environmental Health and Pollution Control.
1974. 6(1). Entry #634.

C-783-74
GUIDELINES ON THE USE AND ACCEPTABILITY OF OIL SPILL DISPERSANTS

Ruel, M., S. L. Ross, E. Nagy, and J. B. Sprague. 1973.
Environmental Protection Service Report Series EPS 1-EE-73-1.
60 p.

The report presents the foundation of Environment Canada Guidelines on the Use and Acceptability of Oil Spill Dispersants. Requirements and procedures for determining the suitability of a dispersant, based on these guidelines, are described.

Standards, regulations and planning

Citation Source: Pollution Abstracts. 1975. 6(1).
Entry #75-00260.

H. BIBLIOGRAPHIES

C-784-74
TANKERS

Anon. 1974.
U.S. Defense Documentation Center, Report DDC-TAS-73-81. Ref. Order No. AD-772 300/OGA.

Annotated references on such topics as oil pollution control, cargo vessel capability and harbor facilities are cited.

Citation Source: Oceanic Abstracts. 1975. 12(1). Entry #75-00910.

C-785-74
SUPERTANKERS AND SUPERPORTS. A BIBLIOGRAPHY WITH ABSTRACTS

Habercom, G. E., Jr. 1974.
Report for 1974 supersedes report dated October, 1973, COM-73-11715. 76 p.

The bibliography contains 60 selected abstracts of research reports related to the construction and operation of supertankers and their port facilities, and environmental considerations of such development.

Biological effects of oil prospecting and production

Citation Source: Government Reports Announcements. 1974. 7(26).
Entry # NTIS/PS-74/088.

C-786-74
WASTE PROCESSING IN THE CHEMICAL AND PETROCHEMICAL INDUSTRIES--A BIBLIOGRAPHY WITH ABSTRACTS

Lehmann, E. J. 1973.
NTIS Publication NTIS-WIN-73-022. NTIS Report COM-73-11386. 87 p.

Eighty-seven abstracts of research reports discussing control processes, economic factors and abatement strategies for the chemical and petrochemical industries are included in the bibliography on industrial waste treatment.

Citation Source: Selected Water Resources Abstracts. 1974. 7(23).
Entry # W74-12069.

C-787-74
OIL SPILL REMOVAL. A BIBLIOGRAPHY WITH ABSTRACTS

Smith, M. 1974.
Government Reports Announcements 74(13):104.

A bibliography on oil spill removal is provided, containing 114 selected abstracts concerned with such topics as oil-water separators, skimmers, dispersants, enzymes and adsorbents.

Cleanup and recovery

Citation Source: Pollution Abstracts. 1975. 6(1). Entry #75-00153.

SECTION II. CURRENT STATUS OF SOME OF THE RESEARCH PROJECTS AS LISTED IN PREVIOUS REPORTS

A. OIL POLLUTION DETECTION AND EVALUATION

1. MONITORING

R-166-74
EFFECT ON THE ECOLOGY AND BIOCHEMISTRY IN COLD ENVIRONMENTS OF OIL SEEPAGES AND SPILLS

Principal Investigator: Brown, J., and R. Murrmann
Performing Organization: U.S. Army Cold Region Research and Engineering Laboratory, P.O. Box 282, Hanover, New Hampshire 03755
Supporting Agency: U.S. Department of Defense, Army, No. DAOZ8146
Period: 7/72 to 6/73 Funds: Unknown

The project has been completed and a final report will be available sometime in 1975.

Information Source: J. Brown, Department of the Army, U.S. Army Cold Region Research and Engineering Laboratory, Hanover, New Hampshire 03755.

R-169-74
DEVELOP CHEMICAL STANDARDS FOR GROWING AREA

Principal Investigator: Lamb, J. B.
Bureau of Foods
Performing Organization: U.S. Department of Health, Education and Welfare, Public Health Service, Food and Drug Administration, Washington, D.C. 20204
Supporting Agency: U.S. Department of Health, Education and Welfare, Public Health Service, Food and Drug Administration, Bureau of Foods
Period: 7/73 to 6/74 Funds: Unknown

The project is involved with the monitoring of shellfish growing areas which have been contaminated by oil spills. A contract has been initiated to determine levels of polynuclear aromatics found in shellfish from both the non-spill areas and the retail market. No reports are yet available.

Information Source: J. B. Lamb, Division of Food Technology, Bureau of Foods, Public Health Service, Food and Drug Administration, Washington, D.C.

R-170-74

ANALYSIS AND CHARACTERIZATION OF PETROCHEMICALS IN WATER AND SEDIMENT

Principal Investigator: Unknown
Water Resources Division
Performing Organization: U.S. Department of the Interior, Geological Survey, Washington, D.C.
Supporting Agency: Department of the Interior, Geological Survey, Water Resources Division NR-69-062
Period: 7/72 to 6/73 Funds: Unknown

The project was suspended in 1972.

Information Source: G. W. Whetstone, United States Department of the Interior, Geological Survey, Reston, Virginia 22092.

R-171-74

MOVEMENT AND FATE OF SUNKEN OIL

Principal Investigator: Wood, P. C.
Performing Organization: Ministry of Agriculture, Burnham on Crouch, England
Supporting Agency: United Kingdom Government
Period: 7/72 to 6/73 Funds: Unknown

The major interest of the project was the implications of sinking oil to commercial fisheries, as part of clean-up procedures at sea. The work has been discontinued and transferred to the Department of Agriculture and Fisheries for Scotland, Aberdeen. Two additional studies are being conducted by the Ministry of Agriculture, Fisheries, and Food. One project, being carried out jointly with the Norwegians and the laboratories in Scotland, is surveying areas of the North Sea subject to oil exploitation; samples of benthos and fish are being collected for hydrocarbon analysis. No results are yet available. A second project, soon to be started, will attempt to determine the fate of various hydrocarbon components in the immediate environment of a quantifiable point source input.

Reports

TOXICITY OF OIL-SINKING AGENTS

Blackman, R. A. A. 1973.
International Council for the Exploration of the Sea, Fisheries Improvement Committee, C.M. 1973/E:10.

The toxic effect of the sand-sink method (spraying oil with a slurry of sand and seawater with tallow amine acetates as a wetting agent) was tested on brown shrimps (*Crangon crangon*). The concentration of the solvent throughout the water column after application indicates the unlikelihood of toxic effects.

EFFECTS OF SUNKEN OIL ON THE FEEDING OF PLAICE ON BROWN SHRIMPS AND OTHER BENTHOS

Blackman, R. A. A. 1974.
International Council for the Exploration of the Sea, Fisheries Improvement Committee, C.M. 1974/E:24.

The effects of prey containing oil and oil on tank bottoms upon predation behavior of demersal fish were tested. The fish caught shrimp that had ingested oil more easily because of the shrimp's reduced specific gravity.

Information Source: I. C. White, Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Remembrance Ave., Burnham on Crouch, Essex, England.

2. REMOTE SENSING

R-172-74
EFFECT OF WATER POLLUTION ON NAVAL OPERATIONS

Principal Investigators: Gallagher, J. J., and D. F. Guiliano
Performing Organization: U.S. Navy Underwater Systems Center,
Newport, Rhode Island 02840
Supporting Agency: U.S. Department of Defense, Navy,
No. DN014506
Period: 7/72 to 6/73 Funds: Unknown

The Underwater Systems Center's pollution research program was instituted in 1970 and terminated two years later. The program addressed measurement techniques, and in particular airborne remote sensing. The techniques were planned for oil slick monitoring but the program was terminated before an oil pollution oriented task could be implemented.

Information Source: J. Gallagher, New London Laboratory, Naval
Underwater Systems Center, New London,
Connecticut 06320.

R-173-74
REMOTE SENSING FOR WATER AND AIR POLLUTION

Principal Investigator: Goodwin, G.
Performing Organization: U.S. National Aeronautic and Space
Administration, Ames Research Center,
Moffett Field, California 94035
Supporting Agency: U.S. National Aeronautic and Space Administration, Aeronautics and Space Technical
Office, Ames Research Center, No. 160-75-22
7370495
Period: 7/72 to 6/73 Funds: Unknown

The project has been completedand a final report is being prepared. Four technical papers have been published on the subject.

Reports and Publications

AIRBORNE OPTICAL DETECTION OF OIL ON WATER

Millard, J. P., and J. C. Arvesen. 1972.
Applied Optics 11(1):102-107.

Various techniques for detecting oil on water utilizing reflected sunlight were evaluated. It was found that maximum oil-water contrast was in the UV and red portions of the spectrum; blue-green yielded minimum levels of contrast. Differential polarization appeared to be one of the most promising techniques. Oil identification could not be made because characteristic absorption bands were not evident and oil-water contrast was greatly influenced by sky conditions.

EFFECTS OF SKYLIGHT POLARIZATION, CLOUDINESS, AND VIEW ANGLE ON THE DETECTION OF OIL ON WATER

Millard, J. P., and J. C. Arvesen. 1971.
American Institute of Aeronautics and Astronautics, AIAA Paper No. 71-1075. 7 p.

The authors evaluate three passive radiometric techniques for use in remote sensing of oil spills. Conclusions are drawn as to the most promising technique and explanations are given to describe why previous total-radiance measurements yielded highest contrast between oil and water under overcast skies.

POLARIZATION: A KEY TO AN AIRBORNE OPTICAL SYSTEM FOR THE DETECTION OF OIL ON WATER

Millard, J. P., and J. C. Arvesen. 1973.
Science 180:1170-1171.

"Skylight polarization, varying with the sun's position in the sky, influences the contrast of oil on water. Good contrast is most consistently obtained by viewing in azimuth directions toward or away from the sun, and the contrast is enhanced by imaging selected polarization components and by taking the difference between orthogonal polarization components."

VIDEO SYSTEMS FOR REAL TIME OIL-SPILL DETECTION

Millard, J. P., J. C. Arvesen, P. L. Lewis, and G. F. Woolerer. 1973.
ISA Reprint Copyright 1973 of study presented at the Second Joint Conference on Sensing of Environmental Pollutants, Washington, D. C., December 10-12, 1973. p. 355-361.

A conventional TV camera, cameras operating in a subtractive mode, and a field-sequential camera are three types of airborne television systems being developed to detect oil spills. The potential usefulness and limitations for each of the systems are discussed.

Information Source: J. P. Millard, National Aeronautics and
Space Administration, Ames Research Center,
Moffett Field, California 94035.

R-174-74

MARINE POLLUTION MONITORING AND ASSESSMENT

Principal Investigator: Love, E. S.
Performing Organization: U.S. National Aeronautics and Space
Administration, Langley Research Center,
Hampton, Virginia 23365
Supporting Agency: U.S. National Aeronautics and Space Administration, Aeronautics and Space Technical
Office, Langley Research Center,
No. 176-53-321 7470481
Period: 7/73 to 6/74 Funds: Unknown

The project conducted by NASA Langley Research Center is entitled "A Study of the Chemical Fate and Biological Consequences of No. 2 Fuel Oil Spills in Seminatural Ecosystems." The study is continuing with completion expected January, 1976.

Reports and Publications

IDENTIFICATION OF HYDROCARBONS IN AN EXTRACT FROM ESTUARINE WATER ACCOMMODATED NO. 2 FUEL OIL

Bieri, R. H., G. Losser, R. J. Huggett, A. L. Walker, and B. W. Lewis. 1974.
Proceedings of the Marine Pollution Monitoring (Petroleum) Symposium and Workshop, May 13-17, 1974. National Bureau of Standards, Gaithersburg, Maryland.

The use of the mass spectrometer with interfaced gas chromatograph and data handling system for hydrocarbon analysis is described.

HYDROCARBONS IDENTIFIED IN EXTRACTS FROM ESTUARINE WATER ACCOMMODATED NO. 2 FUEL OIL BY GAS CHROMATOGRAPHY - MASS SPECTROMETRY

Lewis, B. W., A. L. Walker, and R. H. Bieri. 1974.
NASA Technical Memorandum, NASA TM X-72009. 10 p.

Computerized gas chromatograph-mass spectrometer analyses were conducted on methylene chloride and n-heptane extracts of a No. 2 fuel oil accommodated estuarine water samples. The results of the analyses and a description of the method are given.

Information Source: E. S. Love, National Aeronautics and Space Administration, Langley Research Center, Hampton, Virginia 23665.

3. ANALYSIS

R-029-74
FINGERPRINTING OF OIL SPILLED IN THE MARINE ENVIRONMENT

Principal Investigator: Kolpack, R. L.
Performing Organization: University of California, Graduate School, Los Angeles, California 90007
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Sea Grant Office
Period: 7/72 to 6/73 Funds: $15,000

The project was discontinued under U.S. Department of Commerce funding. The publication, "Microbial Decomposition Patterns Using Crude Oil," is the only paper presently available from the project.

Publications

MICROBIAL DECOMPOSITION PATTERNS USING CRUDE OIL

Mechalas, B. J., T. J. Meyers, and R. L. Kolpack. 1973. In: The Microbial Degradation of Oil Pollutants. Louisiana State University Center for Wetland Resources LSU-SG-73-01. p. 67-79.

A series of experiments was conducted to determine the sequence of microbial degradation in Santa Barbara crude oil. The n-paraffin and isoprenoid components are first to be degraded and order of break-down is dependent upon molecular weight.

Information Source: R. L. Kolpack, Environmental Geology, University of Southern California, Los Angeles, California 90007.

R-178-74
GEOCHEMISTRY OF OILFIELD BRINES

Principal Investigators: Collins, A. G., J. W. Davis, G. E. Fletcher, and C. A. Pearson
Performing Organization: U.S. Department of the Interior, Bureau of Mines, Bartlesville, Oklahoma 74003
Supporting Agency: U.S. Department of the Interior, Bureau of Mines, No. 4011-6
Period: 7/73 to 6/74 Funds: $86,000

The project is active at present.

Reports and Publications

API RECOMMENDED PRACTICE FOR ANALYSIS OF OIL-FIELD WATERS

American Petroleum Institute.
Official Publication

The edition contains various procedures for oil-field water analyses. Several procedures included aid in the evaluation and resolution of pollution problems.

ARE OIL- AND GAS-WELL DRILLING, PRODUCTION, AND WASTE DISPOSAL PRACTICES POTENTIAL POLLUTANTS OF THE ENVIRONMENT?

Collins, A. G. 1970.
Report presented September 13-18, 1970, 160th National American Chemical Society Meeting, Chicago, Illinois.

Summary not available.

OIL AND GAS WELLS--POTENTIAL POLLUTERS OF THE ENVIRONMENT?

Collins, A. G. 1971.
Journal Water Pollution Control Federation 43(12):2383-2393.

The paper contains a discussion of the possible sources of environmental pollution from drilling fluids, drilling muds, oil well cuttings and treatment chemicals. The need for further evaluation of these pollution sources is emphasized.

Information Source: A. G. Collins, Production Research, U.S. Department of the Interior, Bureau of Mines, Bartlesville Energy Research Center, P.O. Box 1398, Bartlesville, Oklahoma 74003.

R-182-74
OIL SPILL IDENTIFICATION

Principal Investigators: Ferrero, E. P., C. C. Ward, and H. J. Coleman
Performing Organization: U.S. Department of the Interior, Bureau of Mines, Bartlesville, Oklahoma 74003
Supporting Agency: U.S. Department of the Interior, Bureau of Mines, No. 8759-19
Period: 7/73 to 6/74 Funds: $76,000

The Bartlesville Energy Research Center has an active research program relating to "Identification of Oil Spills." The Bureau of Mines has analyzed crude oils from all over the world with an objective of improving petroleum utilization. The purpose of this continuing research is to determine and measure distinctive properties of crude oils and crude oil residues and to establish reliable definitive interrelationships between these diverse properties for improved oil spill "fingerprinting" and identification.

The following manuscripts are in various stages of publication as Bureau of Mines Reports of Investigations:

CRUDE OIL SPILLS RESEARCH--AN INVESTIGATION AND EVALUATION OF ANALYTICAL TECHNIQUES, by Wilson, C. A., E. P. Ferrero, and H. J. Coleman.

CRUDE OIL SPILLS RESEARCH--ATOMIC ABSORPTION TECHNIQUES FOR VANADIUM AND NICKEL, by Wilson, C. A., E. P. Ferrero, and H. J. Coleman.

Publications

BUMINES DATA PROMISE HELP IN IDENTIFYING PETROLEUM-SPILL SOURCES

Whisman, M. L., and F. O. Cotton. 1971.
The Oil and Gas Journal, December 27, 1971.

The problems of oil source identification and use of computer-access data banks containing crude oil analyses are discussed.

Information Source: H. J. Coleman, Chemistry and Refining Research, U.S. Department of the Interior, Bureau of Mines, Bartlesville Energy Research Center, P.O. Box 1398, Bartlesville, Oklahoma 74003.

R-183-74
OIL POLLUTION OF RIVERS, METHODS OF ANALYSIS

Principal Investigator: Glenn, W. J.
Performing Organization: Department of Environment, London, England
Supporting Agency: United Kingdom Government
Period: 7/72 to 6/73 Funds: Unknown

The project is no longer in progress.

Publications

INLAND OIL SPILLS - EMERGENCY PROCEDURES AND ACTION

Oil and Water Industries Working Group. 1972.
Institute of Petroleum, London.

The report contains procedures to be undertaken in the event of an inland oil spill.

THE BATTLE AGAINST OIL POLLUTION AT SEA

Department of Trade and Industry. 1973.
Trade and Industry, Supplement to July 26, 1973 issue.
(Available from Department of Trade and Industry, Marine Division, Sunley House, 90-93 High Holborn, London, WCIV 6LP).

The Department of Trade and Industry has the responsibility for dealing with any major threat of coastal pollution which may arise from oil at sea. The supplement describes the causes and effects of oil pollution at sea, national and international organizations established to deal with it, and current research being conducted to improve methods of dealing with a large oil spill.

OIL POLLUTION OF THE SEA AND SHORE

Warren Spring Laboratory, Department of Trade and Industry.

A study of remedial measures.

A BIBLIOGRAPHY ON MARINE AND ESTUARINE OIL POLLUTION

Marine Biological Association of the United Kingdom.

Summary not available.

Information Source: G. A. P. Jolliffe, Directorate General
Water Engineering, Department of the
Environment, 2 Marsham St., London SW1 P3EB.

R-185-74
QUANTITATIVE ANALYSIS OF OIL BY INFRARED SPECTROPHOTOMETRY

Principal Investigator: Gruenfeld, M.
Performing Organization: U.S. Environmental Protection Agency,
Edison Water Research Laboratory,
Cincinnati, Ohio
Supporting Agency: U.S. Environmental Protection Agency,
Office of Research and Development No. 21
AOE 02 72P17896
Period: 7/73 to 6/74 Funds: Unknown

Reports

QUANTITATIVE ANALYSIS OF PETROLEUM OIL POLLUTANTS BY INFRARED SPECTROPHOTOMETRY

Gruenfeld, M.
Preprint from author.

The accuracy and sensitivity of the infrared technique used for quantitative determination of petroleum oils by single point source analysis is described. Solvents used are carbon tetrachloride, Freon 113, and a mixture of the two. Infrared oil detection limits, oil absorptive stability during prolonged solution storage, and the utility of these absorptivities for oil identification are examined.

Information Source: M. Gruenfeld, Environmental Protection Agency, Regional Office II, Edison, New Jersey 08817.

B. OIL POLLUTION CONTROL

1. CONTAINMENT

R-046-74
OIL CONTAINMENT SYSTEMS - CHEMICALLY JELLED BOOMS

Principal Investigator: Unknown
Performing Organization: U.S. Environmental Protection Agency Office of Water Programs, Washington, D.C. 20242
Supporting Agency: U.S. Department of Transportation, Coast Guard No. 012108
Period: 7/72 to 6/73 Funds: Unknown

This contract was not awarded.

Information Source: K. Adams, Environmental Protection Agency, Washington, D.C. 20460.

2. CLEANUP AND RECOVERY

R-208-74
ASSESSMENT AND TESTING OF OIL DISPERSANTS FOR USE AT SEA

Principal Investigator: Wood, P. C.
Performing Organization: Ministry of Agriculture, Burnham on Crouch, England
Supporting Agency: United Kingdom Government
Period: 7/73 to 6/74 Funds: Unknown

Work related to this topic is still underway under a project entitled, "The Toxicity of Oils, Oil Dispersants and Mixtures." The toxicity of new oil dispersant formulations is being assessed using standard toxicity tests. Research is also underway on the toxicity of selected oils and oil dispersant components, the latter in an attempt to identify the most toxic components. New toxicity testing methods and techniques for use with oil and dispersants are being developed. The work is being done in cooperation with the Warren Spring Laboratory, which is concerned with the efficiency of oil cleanup methods. (See R-235-74 for publications)

Information Source: I. C. White, Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Remembrance Avenue, Burnham on Crouch, Essex, England.

R-209-74
TREATMENT OF OIL SPILLS, ESPECIALLY SINKING AND DISPERSION

Principal Investigator: Wood, P. C.
Performing Organization: Ministry of Agriculture, Burnham on Crouch, England
Supporting Agency: United Kingdom Government
Period: 7/73 to 6/74 Funds: Unknown

The project is closely related to Entry R-208-74, "Assessment and Testing of Oil Dispersants for Use at Sea." The implications to commercial fish, shellfish and other marine resources of all oil, cleanup or prevention methods are assessed as and when new methods are proposed.

Information Source: I. C. White, Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Remembrance Avenue, Burnham on Crouch, Essex, England.

C. EFFECTS OF OIL POLLUTION

1. BIOLOGICAL EFFECTS

R-083-74
INTERNATIONAL ENVIRONMENTAL ASSESSMENT STUDIES - INDONESIA AND GHANA

Principal Investigators: Eilers, W. L., and P. H. Freeman
Performing Organization: Smithsonian Institution, Washington, D.C. 20560
Supporting Agency: U.S. Department of State, Agency for International Development, Contract AID/CSD-2608-3
Period: 7/73 to 6/74 Funds: $145,237

A series of case studies have bene conducted and environmental guidelines on selected environmental problems in developing countries have been produced. These case studies and three guideline booklets are completed and now in press.

1) The environmental consequences of rapid urbanization in Seoul, Korea
2) The environmental impact of a large tropical man-made lake (Lake Volta, Ghana)
3) Coastal zone pollution in Indonesia, with special emphasis upon oil.

Information Source: W. L. Eilers, Office of International and Environmental Programs, Smithsonian Institution, Washington, D.C. 20560.

R-093-74
EFFECTS OF CRUDE OIL SPILLS ON TERRESTRIAL VEGETATION AND ON LAKE PHYTOPLANKTON IN THE NORMAN WELLS REGION AND THE TUKTOYAKTUK REGION NWT

Principal Investigators: Hutchinson, T. C., J. Hellebust, and M. Telford
Performing Organization: University of Toronto, Ontario, Canada
Supporting Agency: Department of Indian Affairs and Northern Development, Canadian Government
Period: 7/73 to 3/74 Funds: $86,000

The project is an ongoing one. Papers resulting from the study are to be given at the Conference on the Control and Prevention of Oil Spills, April, 1975, San Francisco. Four papers will be included in the Proceedings of the Society of International Limnologists Conference, Winnipeg, 1974, one paper in Environmental Pollution No. 1, 1975 (with P. Kauss), and two papers are forthcoming in the first issue of Canadian Botany, 1975. All deal with different aspects of oil toxicity.

Publications

THE PHYTOTOXICTY OF CRUDE OIL SPILLS IN FRESHWATER

Hutchinson, T. C., P. Kauss, and M. Griffiths. 1972. Institute of Environmental Sciences and Engineering, Publication No. EI-4. Reprinted from Water Pollution Research in Canada.

Field toxicity tests on planktonic algae were performed using crude oil, crude oil-water extracts, and selected oil components. The effects of the oil on the algal species varied from a growth inhibiting reaction to a stimulating reaction. Water soluble components of crude oil in laboratory tests were toxic to the algae and reduced algal growth by increasing water acidity.

OIL SPILLS AND VEGETATION AT NORMAN WELLS, N.W.T.

Hutchinson, T. C., and J. A. Hellebust. 1974. Environmental-Social Committee on Northern Pipelines, Task Force on Northern Oil Development Report No. 73-43. Information Canada Cat. No. R72-10773 QS-1538-000-EE-A1.

The effects of natural and simulated oil spills on characteristic terrestrial and aquatic vegetational ecosystems in the Mackenzie Valley were determined. Terrestrial vegetation varied in resistance to oil exposure and overall cover was reduced by a factor of up to four. The effects upon aquatic vegetation were variable; the higher plants that grew partially above the water surface were damaged to the greatest degree and lake phytoplankton were damaged least.

THE TOXICITY OF CRUDE OIL AND ITS COMPONENTS TO FRESHWATER ALGAE

Kauss, P., T. C. Hutchinson, C. Soto, J. Hellebust, and M. Griffiths. 1973.
Conference on Prevention and Control of Oil Spills, 1973, Washington, D.C.

Field tests measuring crude oil toxicity on freshwater algae indicated that the algal responses were species-specific, varying from suppression to stimulation of growth. Toxicity of seven different crude oils on Chlorella vulgaris was variable in lab studies.

Information Source: T. C. Hutchinson, Institute for Environmental Studies, University of Toronto, Toronto, Canada M5S 1A4.

R-098-74

OFFSHORE TERMINAL OPERATIONS IMPACT

Principal Investigator: Maurer, D.
Performing Organization: University of Delaware, School of Marine Science, Newark, Delaware 18711
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Sea Grant Office No. 2-35223
Period: 9/72 to 8/73 Funds: Unknown

Continuing research is being conducted in the following areas: Sublethal Effects of Crude Oil on Juvenile Mercenaria mercenaria; Environmental Aspects of Offshore Multi-Use Port Islands (study funded by NSF/RANN, a full report is forthcoming); and Baseline Studies of Lower Delaware Bay (study funded by NSF/RANN, no reports are yet available).

Reports

IMPACTS OF A DEEPWATER TERMINAL VOLUME I. ENVIRONMENTAL PROBLEMS ASSOCIATED WITH A DEEPWATER PORT

Maurer, D.
Report to the National Science Foundation, RANN Program

The objective of the study was to analyze and collate existing data related to the environmental vulnerability of selected sites to construction and operation of deepwater port facilities. The work was a part of a broad-based study headed by the Council on Environmental Quality. Descriptions of the marine biota of the proposed areas and assessments of the sensitivity to stress of individual species were among the principal topics.

Information Source: L. Watling, College of Marine Studies, Field Station, University of Delaware, Lewes, Delaware 19958.

R-101-74

MARINE PETROLEUM POLLUTION - BIOLOGICAL EFFECTS AND CHEMICAL CHARACTERIZATION

Principal Investigators: Nicol, J. A., and C. Van Baalen
Performing Organization: University of Texas, Marine Science Institute, Port Aransas, Texas 78373
Supporting Agency: U.S. National Science Foundation, Division of National and International Progress, GX-37345
Period: 2/73 to 1/74 Funds: $142,150

Publications

THE EFFECTS OF A NO. 2 FUEL OIL AND TWO CRUDE OILS ON THE GROWTH AND PHOTOSYNTHESIS OF MICROALGAE

Pulich, W. M., Jr., K. Winters, and C. Van Baalen. 1974.
Marine Biology 28:87-94.

Reported are the effects of two crude oils and water solubles from these oils and from a No. 2 fuel oil on the growth and photosynthesis of pure cultures of microalgae.

Information Source: C. Van Baalen, University of Texas at
Austin, Marine Science Institute, Port
Aransas, Texas 78373.

R-123-74
MONITORING OF MARINE POLLUTION PROBLEMS

Principal Investigator: Westman, W. E.
Performing Organization: University of Queensland, St. Lucia, Queensland, Australia
Supporting Agency: University of Queensland
Period: 7/72 to 6/73 Funds: Unknown

The project is currently active with one publication resulting from the study.

Publication

BIOASSAYS AND BIOLOGICAL MONITORING

Westman, W. E. 1974.
In: A Compilation of Australian Water Quality Criteria.
Australian Water Resources Council. Technical Paper No. 7:
275-281.

The paper is a literature review.

Information Source: W. E. Westman, Visiting Lecturer in
Environmental Planning & Management,
University of California, School of
Architecture and Urban Planning, Los
Angeles, California 90024

R-212-74
FATE AND EFFECTS OF OIL AND OIL COMPOUNDS ON MARINE COASTAL ECOSYSTEMS

Principal Investigators: Bean, R. M., and J. A. Lichatowich

Performing Organization: Battelle Memorial Institute, P.O. Box
999, Richland, Washington 99352
Supporting Agency: U.S. Atomic Energy Commission, Biomedical
and Energy Research Division
Period: 7/73 to 6/74 Funds: $60,000

The following are articles which appeared in the 1974 Annual DBER Report. The 1975 Annual Report, No. 1950-Pt. 2, BNWL, will be published and ready for distribution in March, 1975, and will include "Characterization of Petroleum Hydrocarbons in the Marine Environment," by R. M. Bean.

Reports

DETERMINATION OF SOLUBLE AROMATIC HYDROCARBONS IN SUSPENSIONS OF PETROLEUM IN SEAWATER

Bean, R. M., and J. W. Blaylock. 1974.
In: 1974 Annual DBER Report, No. 1850-Pt. 2.

The goal of the work was to develop a rapid procedure for determining the water-miscible hydrocarbon composition of oil/water mixtures, particularly of the aromatic hydrocarbons. Carbon tetrachloride was used in the method to extract the filtered water samples and analysis of the individual hydrocarbon components was performed using gas chromatography.

NONNUCLEAR EFFLUENTS: EFFECTS OF CRUDE OIL ON MARINE INTERTIDAL COMMUNITIES

Bean, R. M., J. R. Vanderhorst, and R. Y. Ting. 1974.
1974 Annual DBER Report, No. 1850-Pt. 2.

Discussed are the combined chemical/biological treatment methods developed by Battelle to study the impact of crude petroleum on marine communities.

Information Source: R. M. Bean, Battelle Pacific Northwest
Laboratories, Battelle Blvd., Richland,
Washington 99352.

R-217-74
EFFECTS OF PETROLEUM OILS, OIL DISPERSANTS, PETROCHEMICAL WASTES, AND ASSOCIATED POLLUTANTS ON MARINE LIFE

Principal Investigator: Hegre, C. S.
Performing Organization: U.S. Environmental Protection Agency,
National Environmental Research Center,
Corvallis, Oregon

Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 16 AAV 12 72P17877
Period: 7/73 to 6/74 Funds: Unknown

The project is currently emphasizing studies of water-soluble fractions of oils introduced into marine waters after oil-water separation.

Reports and Publications

BIOLOGICAL EFFECTS OF SHORT-TERM EXPOSURES TO HAZARDOUS MATERIALS

LaRoche, G. 1972.
Proceedings of the 1972 National Conference of Hazardous Material Spills. p. 199-206.

The importance of short-term bioassays in identifying toxicological responses is discussed. The need to detect subtle damage, caused by pollutant concentrations in the environment, which may impair the survival of a species, is stressed.

BIOASSAY PROCEDURES FOR OIL AND OIL DISPERSANT TOXICITY EVALUATION

LaRoche, G., R. Eisler, and C. M. Tarzwell. 1970.
Journal Water Pollution Control Federation 42(11):1982-1989.

A method has been devised to test for relative 96-hour toxicities of crude oils, oil-spill removers, and oil-dispersant mixtures on a fish, Fundulus heteroclitus, a sand worm, Nereis virens, and a grass shrimp, Palaemonetes vulgaris. The ease of operation and versatility of the system is discussed.

STANDARD METHODS FOR DETERMINATION OF RELATIVE TOXICITY OF OIL DISPERSANTS AND MIXTURES OF DISPERSANTS AND VARIOUS OILS TO AQUATIC ORGANISMS

Tarzwell, C. M.
Citation not given.

Standard methods for testing the relative toxicity of oil dispersants and oil-dispersant mixtures are described for use with fish (Pimephales promelas, freshwater, and Fundulus heteroclitus, salt water), larval oysters (Crassostrea virginica) and brine shrimp (Artemia salina).

USING ARTEMIA TO ASSAY OIL DISPERSANT TOXICITIES

Zillioux, E. J., H. R. Foulk, J. C. Prager, and J. A. Cardin.
1973.
Journal Water Pollution Control Federation 45(11):2389-2396.

The use of brine shrimp (*Artemia salina*) nauplii as a bioassay species for oil dispersant toxicity tests is described. All conditions are standardized including the use of artificial seawater.

Information Source: C. S. Hegre, U.S. Environmental Protection Agency, National Marine Water Quality Laboratory, South Ferry Rd., Narragansett, Rhode Island 02882.

R-219-74

ENVIRONMENTAL QUALITY CRITERIA

Principal Investigator: London, S. A.
Performing Organization: U.S. Air Force Aerospace Medical Research Laboratory, 6570 Wright Patterson A.F.B., Dayton, Ohio 45433
Supporting Agency: U.S. Department of Defense, Air Force, No. DF312920
Period: 7/73 to 6/74 Funds: Unknown

This work is not related to oil pollution.

Information Source: S. A. London, U.S. Air Force Aerospace Medical Research Laboratory, 6570 Wright Patterson A.F.B., Dayton, Ohio 45433.

R-221-74

EFFECTS OF INDUSTRIAL DEVELOPMENTS ON ALASKA'S LIVING MARINE RESOURCES

Principal Investigators: Merrell, T. R., R. T. Myren, R. Rice, H. E. Bruce, H. Sears, C. R. Mattson
Performing Organization: U.S. Department of Commerce, Auke Bay Fisheries Laboratory, P.O. Box 155, Auke Bay, Alaska 99821
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, No. 720581 028180928
Period: 7/72 to 6/73 Funds: $250,000

Ongoing research is being continued in three major areas: (1) determining effects of logging on marine ecosystems; (2) establishing baselines of intertidal organisms in Prince William Sound and the Gulf of Alaska to evaluate effects of oil development; and (3) determining effects of crude oil on Alaskan organisms by means of laboratory bioassays.

Reports and Publications

EFFECTS OF OIL ON MARINE ECOSYSTEMS: A REVIEW FOR ADMINISTRATORS AND POLICY MAKERS

Evans, D. R., and S. D. Rice. 1974.
NOAA Fishery Bulletin 72(3):625-638.

A review of recent literature concerning the effects of oil on marine ecosystems is given to provide an information source for administrators and policy makers. Characteristics of crude oil and the danger of chronic low-level pollution are among the topics included.

EFFECTS OF PRUDHOE BAY CRUDE OIL ON MOLTING TANNER CRABS, *CHIONOECETES BAIRDI*

Karinen, J. F., and S. D. Rice. 1974.
MFR Paper 1074 from Marine Fisheries Review 36(7):31-37.

In laboratory tests, Prudhoe Bay crude oil was found to have detrimental effects on premolt and postmolt juvenile male Tanner crabs (*Chionoecetes bairdi*). Estimated 48 hour TLM (median tolerance limits) were 0.56 ml oil/liter for both stages. With increasing oil exposure molting success decreased and during oil exposure newly molted crabs autotomized limbs.

TOXICITY AND AVOIDANCE TESTS WITH PRUDHOE BAY OIL AND PINK SALMON FRY

Rice, S. D. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C. p. 667-670.

Acute toxicity concentration levels were determined for Prudhoe Bay crude oil on pink salmon fry in fresh-and salt water. The observed 96-hour TLM values were lower for fry in freshwater than salt water (88 mg oil/liter vs. 213 mg oil/liter in June and 110 mg oil/liter in August). Older fry were more susceptible to oil toxicity and were more sensitive in their detection and avoidance of oil than younger fry.

Information Source: T. R. Merrell, Jr., U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Auke Bay Fisheries Laboratory, P.O. Box 155, Auke Bay, Alaska 99821.

R-223-74

DETERMINATION OF THE ENVIRONMENTAL EFFECTS OF OFF-SHORE PIPELINES

Principal Investigator: Morrison, D. L.
Performing Organization: Battelle Memorial Institute, 505 King Ave., Columbus, Ohio 43201
Supporting Agency: No formal support reported
Period: 1/73 to 12/73 Funds: Unknown

The third year of work on the project was being completed with a completion date planned for the end of 1974. A report on this project will be released sometime during the first half of 1975.

Reports

ENVIRONMENTAL ASPECTS OF GAS PIPELINE OPERATIONS IN THE LOUISIANA COASTAL MARSHES

McGinnis, J. T., R. A. Ewing, C. A. Willingham, S. E. Rogers, D. H. Douglass, and D. L. Morrison. 1972.
Final Report to Offshore Pipeline Committee, December, 1972, Battelle, Columbus Laboratories.

The objective of the study was to provide an overview of the broad environmental issues confronting the gas pipeline industry in their efforts to traverse marshlands with pipelines serving offshore Louisiana gas and oil leases. The emphasis of the study was on the coastal marshes from the low water line at the Gulf of Mexico to 20 to 40 miles inland to high ground.

Information Source: D. L. Morrison, Energy/Environmental Programs Office, Battelle, Columbus Laboratories, Columbus, Ohio 43201.

R-226-74

REMOTE SENSING - WATER AND LAND POLLUTION, BIOTIC AND ABIOTIC DEGRADATION, ENERGY, BUDGET AND CULTURAL PRESSURES

Principal Investigator: Nelson, C. H.
Performing Organization: U.S. National Aeronautic and Space Administration, Langley Research Center, Hampton, Virginia 23365
Supporting Agency: U.S. National Aeronautics and Space Administration, Aeronautics and Space Technical Office, Langley Research Center No. 160-75-22 7370494
Period: 7/72 to 6/73 Funds: Unknown

The project conducted by the NASA Langley Research Center is entitled "A Study of the Chemical Fate and Biological Consequences of No. 2 Fuel Oil Spills in Seminatural Ecosystems." The study is continuing with completion planned for January, 1976.

Reports and Publications

See Entry R-174-74 for a list of publications.

Information Source: E. S. Love, Director for Space, National Aeronautics and Space Administration, Langley Research Center, Hampton, Virginia 23665.

R-229-74

EFFECTS OF ENVIRONMENTAL POLLUTION ON THE AQUATIC RESOURCES

Principal Investigators: Snyder, G. R., T. Blahm, J. Hughes, R. Clark, and C. Sims
Performing Organization: U.S. Department of Commerce, National Marine Fisheries Service, Seattle, Washington 98102
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service
Period: 7/72 to 6/73 Funds: $393,000

The project has been completed. Several more publications, including a final report, are expected to be released.

Reports and Publications

INTERAGENCY INVESTIGATIONS OF A PERSISTENT OIL SPILL ON THE WASHINGTON COAST

Clark, R. C., Jr., and J. S. Finley. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C. p. 793-808.

The report describes the preliminary findings of a 10-month investigation conducted by an interagency team of scientists and engineers on the long-term effects of oil spilled by the grounding of a troopship (General M. C. Meigs, 1972) on an ocean coast, intertidal faunal and floral community. The study revealed that n-paraffin hydrocarbons were taken up by the plants and animals. Several plant species and the urchin *Strongylocentrotus purpuratus* were seriously affected.

PARAFFIN HYDROCARBON PATTERNS IN PETROLEUM POLLUTED MUSSELS

Clark, R. C., Jr., and J. S. Finley. 1973.
Marine Pollution Bulletin 4(11):172-176.

The paper describes modern analytical techniques used to detect hydrocarbons in marine organisms at extremely low concentrations and to estimate the quantity of petroleum pollution uptake in the organisms.

TECHNIQUES FOR ANALYSIS OF PARAFFIN HYDROCARBONS AND FOR INTERPRETATION OF DATA TO ASSESS OIL SPILL EFFECTS IN AQUATIC ORGANISMS

Clark, R. C., Jr., and J. S. Finley. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C. p. 161-172.

The feasibility of using aquatic organisms which originally contained biogenic paraffin hydrocarbons as indicators of petroleum pollution is reported. The analytical technique used to isolate and identify n-paraffin hydrocarbons from plant, animal, and petroleum and sediment samples is described.

ACUTE EFFECTS OF OUTBOARD MOTOR EFFLUENT ON TWO MARINE SHELLFISH

Clark, R. C., Jr., and J. S. Finley. 1974.
Environmental Science and Technology 8(12):1009-1014.

Mussels (Mytilus edulis) exposed to diluted two-cycle outboard motor effluent in seawater displayed physiological stress, degeneration of gill tissue, and uptake of paraffin hydrocarbons from the effluent. Mussel response to the pollutant was immediate and mortality was delayed significantly after removal from the pollutant. Oysters (Ostrea ida) were less affected by the pollutant.

TIDAL AQUARIUM FOR LABORATORY STUDIES OF ENVIRONMENTAL EFFECTS ON MARINE ORGANISMS

Clark, R. C., Jr., and J. S. Finley. 1974.
The Progressive Fish-Culturist 36(3):134-137.

A laboratory test chamber for studying the effects of an oil slick on intertidal organisms was constructed. The test chamber simulated tidal conditions, was free from extraneous hydrocarbon contamination, and could hold a number of small intertidal organisms for short-term (36 to 96 hours) bioassay studies.

Information Source: G. C. Snyder, Environmental Conservation Division, Northwest Fisheries Center, 2725 Montlake Blvd. East, Seattle, Washington 98112.

R-230-74

PHYSIOLOGICAL EFFECT OF CONTAMINANTS - EFFECT OF ALTERATIONS IN THE NATURAL ENVIRONMENT

Principal Investigator: Stansby, M. E.
Performing Organization: U.S. Department of Commerce, Environmental Conservation Division, Seattle, Washington 98112
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, No. FB 1100/2 818 A4
Period: 7/73 to 6/74 Funds: $305,300

The project is a continuing one. Additional studies on effects of oil pollution are included in a subtask entitled, "Contaminant Effects on Vital Functions." Work was started in February, 1974, to examine effects of petroleum hydrocarbons on chemosensory systems and behavior of salmon, crabs, and shrimp.

Reports

PETROLEUM ABSORPTION AND RELEASE AND EFFECTS IN MARINE ORGANISMS

Stansby, M. E. 1974.
Presented at Marine Pollution Monitoring Symposium and Workshop, Gaithersburg, Maryland, May 13-17, 1974.

Studies have been conducted exploring the manner in which petroleum hydrocarbons are picked up, retained, and released by marine organisms, especially at the cellular level. Using carbon 14 radioisotopic and spin labeling techniques, it has been determined that aromatic hydrocarbons preferentially bind to cell surfaces and paraffinic hydrocarbons seek the hydrophobic, lipid-rich cell membrane interior.

METHODS FOR ESTABLISHING LEVELS OF PETROLEUM CONTAMINATION IN ORGANISMS AND SEDIMENT AS RELATED TO MARINE POLLUTION MONITORING

Clark, R. C., Jr. 1974.
Presented at Marine Pollution Monitoring Symposium and Workshop, Gaithersburg, Maryland, May 13-17, 1974.

The accuracy of petroleum analyses of marine organisms is discussed with special reference to background hydrocarbon contamination in laboratory chemicals, solvents, and materials.

ANALYTICAL TECHNIQUES FOR ISOLATING AND QUANTIFYING PETROLEUM PARAFFIN HYDROCARBONS IN MARINE ORGANISMS

Clark, R. C., Jr., and J. S. Finley. 1974.
Presented at Marine Pollution Monitoring Symposium and Workshop, Gaithersburg,Maryland, May 13-17, 1974.

The use of normal paraffin hydrocarbons as tracers or indicator compounds for petroleum pollution is discussed.

Information Source: N. L. Karrick, Environmental Conservation Division, National Marine Fisheries Service, Northwest Fisheries Center, 2725 Montlake Blvd. East, Seattle, Washington 98112.

R-231-74
SURVEY OF SUBLETHAL EFFECTS ON BIOTA OF CHRONIC NATURAL EXPOSURE TO OIL

Principal Investigator: Straughan, D.
Performing Organization: University of Southern California, Allan Hancock Foundation, University Park, Los Angeles, California 90007
Supporting Agency: American Petroleum Institute
Period: 7/73 to 6/74 Funds: $251,500

Publications (Summaries not available)

SOME FACTORS INFLUENCING BYSSUS THREAD PRODUCTION IN MYTILUS EDULIS (MOLLUSCA BIVALVIA) LINNAEUS, 1758

Martella, T. 1974.
Water, Air and Soil Pollution 3(2):171-178.

FIELD SAMPLING METHODS AND TECHNIQUES FOR MARINE ORGANISMS AND SEDIMENTS

Straughan, D. 1974.
Presented IOC/WMO Marine Pollution Monitoring (Petroleum) Symposium and Workshop, National Bureau of Standards, Gaithersburg, Maryland, May 13-17, 1974.

INVESTIGATION OF OVICELL HYPERPLASIA IN BRYOZOANS CHRONICALLY EXPOSED TO NATURAL OIL SEEPAGE

Straughan, D., and D. M. Lawrence. 1974.
Manuscript.

INTRASPECIFIC VARIABILITY IN THE RESPONSE OF *MYTILUS CALIFORNIANUS* (BIVALVIA) TO CRUDE OIL

Kanter, R. 1975.
Manuscript.

THE ROLE OF SPACE AND TIME ON INTRAPOPULATION REPRODUCTIVE VARIABILITY IN *MYTILUS CALIFORNIANUS* (CONRAD)

Jessee, W. 1975.
Manuscript.

SUBLETHAL EFFECTS OF CHRONIC EXPOSURE TO OIL

Straughan, D. 1975.
Report to API in draft form.

Additional Publications

THE SANTA BARBARA OIL SPILL: ECOLOGICAL CHANGES AND NATURAL OIL LEAKS

Straughan, D., and B. C. Abbott. 1971.
Report on Seminar on Water Pollution by Oil Organized by the Institute of Water Pollution Control, Aviemore, Scotland, May, 1970. p. 257-262.

OIL POLLUTION AND WILDLIFE AND FISHERIES IN THE SANTA BARBARA CHANNEL

Straughan, D. 1971.
Transactions Thirty-Sixth North American Wildlife and Natural Resources Conference. p. 219-229.

BIOLOGICAL EFFECTS RESULTING FROM THE SANTA BARBARA OIL SPILL

Straughan, D. 1972.
Proceedings Navy Oil Spill Control Conference, May 1-4, 1972, Washington, D.C. p. 179-192.

BIOLOGY OF SEA MUSSELS (*MYTILUS CALIFORNIANUS* CONRAD AND M. *EDULIS* LINN.) BEFORE AND AFTER THE SANTA BARBARA OIL SPILL (1969)

Straughan, D., and J. R. E. Harger. 1972.
Water, Air and Soil Pollution 1:381-388.

BIOLOGICAL AND OCEANOGRAPHICAL SURVEY OF THE SANTA BARBARA CHANNEL OIL SPILL 1969-1970

Straughan, D. 1971.
2 Volumes. Pub. Allan Hancock Foundation.

A SUMMARY OF THE BENTHOS OFF SANTA BARBARA FOLLOWING THE JANUARY 1969 OIL SPILL

Fauchald, K. 1972.
California Marine Resources Commission, CalCOFI Report 16: 125-129.

THE SANTA BARBARA OIL SPILLS IN PERSPECTIVE

Nicholson, N. L. 1972.
California Marine Resources Commission, CalCOFI Report 16: 130-149.

THE INFLUENCE OF OIL AND DETERGENTS ON RECOLONIZATION IN THE UPPER INTERTIDAL ZONE

Straughan, D. 1971.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 15-17 June, 1971. p. 437-440.

EFFECTS OF EXPOSURE TO OIL ON *MYTILUS CALIFORNIANUS* FROM DIFFERENT LOCATIONS

Straughan, D., R. Kanter, and W. Jessee. 1971.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 15-17 June, 1971. p. 437-440.

SUSCEPTIBILITY TO CRUDE OIL WITH RESPECT TO SIZE, SEASON AND GEOGRAPHIC LOCATION IN *MYTILUS CALIFORNIANUS* (BIVALVIA)

Kanter, R. 1974.
University of Southern California, Sea Grant Program USC-SG-4-74, Los Angeles, California. 43 p.

INTERTIDAL MACROBIOLOGY OF SELECTED SANDY BEACHES IN SOUTHERN CALIFORNIA

Patterson, M. 1975.
University of Southern California, Sea Grant Program USC-SG-74.
Los Angeles, California. 41 p.

A REINVESTIGATION OF SOUTHERN CALIFORNIA ROCKY INTERTIDAL BEACHES THREE AND ONE-HALF YEARS AFTER THE 1969 SANTA BARBARA OIL SPILL: A PRELIMINARY REPORT

Straughan, D., R. Cimberg, and S. Mann. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C. p. 697-702.

BIOLOGICAL STUDIES OF THE SANTA BARBARA OIL SPILL

Straughan, D. 1973.
In: Santa Barbara Channel Revisited, AAPG Trip 3, 1973.
Annual Meeting AAPG-SEPM-SEG. p. 4-16.

THE INFLUENCE OF THE SANTA BARBARA OIL SPILL (JANUARY-FEBRUARY, 1969) ON THE INTERTIDAL DISTRIBUTION OF MARINE ORGANISMS

Straughan, D. 1973.
Report presented to the Western Oil and Gas Association.

TEMPERATURE EFFECTS OF CRUDE OIL IN UPPER TIDAL ZONE

Straughan, D. 1974.
(Report in Press)

Information Source: Dale Straughan, University of Southern California, Allan Hancock Foundation, University Park, Los Angeles, California 90007.

R-233-74
ECOLOGICAL CYCLING OF PETROLEUM DERIVATIVES

Principal Investigators: Turner, M. R., R. L. Ferguson, and D. A. Wolfe
Performing Organization: U.S. Department of Commerce, Atlantic Estuarine Fisheries Center, Beaufort, North Carolina 28516
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, No. R8110303

Period: 7/72 to 6/73 Funds: $37,200

This project was cancelled in June, 1973. At that time, the project was still in developmental stages and only preliminary data had been obtained.

Information Source: D. A. Wolfe, Division of Ecology, National Marine Fisheries Service, Atlantic Estuarine Fisheries Center, Beaufort, North Carolina 28516

R-235-74

ASSESSMENT OF EFFECTS OF OIL AND OIL DISPERSANTS ON FISH, SHELLFISH AND OTHER MARINE RESOURCES

Principal Investigator: Wood, P. C.
Performing Organization: Ministry of Agriculture, Burnham on Crouch, England
Supporting Agency: United Kingdom Government
Period: 7/73 to 6/74 Funds: Unknown

Work related to this topic is still underway under a project entitled, "The Toxicity of Oils, Oil Dispersants and Mixtures." The toxicity of new oil dispersant formulations is being assessed using standard toxicity tests. Research is also underway on the toxicity of selected oils and oil dispersant components, the latter in an attempt to identify the most toxic components. New toxicity testing methods and techniques for use with oil and dispersants are being developed. The work is being done in cooperation with the Warren Spring Laboratory which is concerned with the efficiency of oil cleanup methods.

Reports and Publications

THE DONA MARIKA OIL SPILL

Blackman, R. A. A., J. M. Baker, J. Jelly, and S. Reynard. 1973.
Marine Pollution Bulletin 4(12):181-183.

Information is presented on the damage caused by 3,000 tons of gasoline which was spilled when the tanker Dona Marika ran aground near Wales. The fauna of Lindsay was adversely affected, although there appeared to be no accumulation of lead in the waters or gasoline on the rocks one week after the spill occurrence.

FURTHER INVESTIGATIONS INTO THE TOXICITY OF OIL AND DISPERSANTS

Connor, P. M. 1972.
International Council for the Exploration of the Sea, Fisheries Improvement Committee, C. M. 1972/E:14.

An apparatus to test the toxicity of suspensions of oils and oil-dispersant mixtures was constructed. The toxicity of a low toxicity, high efficiency oil dispersant BP 1100X was found to be greater when kept in suspension versus standard static testing. Also crude oil and topped crude oil were found to increase the toxicity of suspended BP 1100X.

THE TOXICITY OF SEVERAL OIL-SPILL REMOVERS TO SOME SPECIES OF FISH AND SHELLFISH

Portmann, J. E., and P. M. Connor. 1968.
Marine Biology 1(4):322-329.

The toxicity of 12 oil-spill removers and detergents (known as solvent emulsifiers) on four marine shellfish species were examined. The solvent emulsifiers were found to be highly toxic to marine organisms and, if used in certain areas, could cause high mortalities. The solvent fraction of the materials was determined to be the portion responsible for the toxicity. Toxicity of the solvent emulsifiers to marine animals decreased with time, due to evaporation.

TOXICITY TESTING FOR RANKING OILS AND OIL DISPERSANTS

Wilson, K. W.
Citation unknown

Some of the factors to be considered in establishing a standard technique of toxicity testing for ranking oil dispersants are discussed.

THE TOXICITY TESTING OF OILS AND DISPERSANTS: A EUROPEAN VIEW

Wilson, K. W., E. B. Cowell, L. R. Beynon. 1973.
Proceedings of Joint Conference on Prevention and Control of Oil Spills, 13-15 March, 1973, Washington, D.C. p. 255-261.

The European approach to the objectives and problems of testing the toxicity of hydrocarbons and dispersants is reviewed. The aims of the toxicity test are given, and toxicity ranking tests and ecological damage prediction tests are compared and discussed.

Information Source: I. C. White, Ministry of Agriculture,
Fisheries and Food, Fisheries Laboratory,
Remembrance Ave., Burnham on Crouch, Essex,
England.

2. PHYSICAL EFFECTS

R-125-74
UTILIZATION OF A TECHNOLOGY ASSESSMENT OF OUTER CONTINENTAL SHELF OIL AND GAS OPERATIONS

Principal Investigators: Kash, D. E., and I. L. White
Performing Organization: University of Oklahoma, Graduate School,
Norman, Oklahoma 73069
Supporting Agency: U.S. National Science Foundation, Research
Applications Direct., No. GI-29942 A#3
Period: 12/73 to 9/74 Funds: $38,600

The study under Grant GI-29942 was completed and the book, Energy Under the Oceans: A Technology Assessment of Outer Continental Shelf Oil and Gas Operation, was published by the University of Oklahoma Press, September, 1973.

Publications

ENERGY UNDER THE OCEANS: A SUMMARY REPORT OF A TECHNOLOGY ASSESSMENT OF OCS OIL AND GAS OPERATIONS

University of Oklahoma Press, Norman, Oklahoma. 1973.

A 20-month study was conducted in which the Technology Assessment Group of the Science and Public Policy Program at the University of Oklahoma assessed the social impacts and public policy issues related to OCS technologies, management and regulations. As a result of the study, the Group recommended changes in government policy and administration, industry management, and technologies to make OCS development safer and less environmentally threatening. The recommendations are discussed.

Information Source: D. E. Kash, Science and Public Policy Program,
University of Oklahoma, 601 Elm Ave., Norman,
Oklahoma 73069.

R-127-74
A STUDY OF THE HYDROGRAPHY AND WIND-INDUCED CURRENTS IN EASTERN PRINCE WILLIAM SOUND

Principal Investigator: Muench, R.
Performing Organization: University of Alaska, Institute of
Marine Sciences, College, Alaska 99735
Supporting Agency: U.S. Department of Commerce, National Oceanic
and Atmospheric Administration, Sea Grant
Office No. 1-36109
Period: 9/72 to 8/73 Funds: $51,600

A report on the physical oceanographic data obtained in Prince William Sound during 1971-1974 is presently in its final stages of preparation. The report will be submitted to the University of Alaska Sea Grant Program and will eventually be made available through NTIS or as a Sea Grant report. An M.S. thesis should result from this work by summer, 1975.

Information Source: R. D. Muench, Institute of Marine Science,
Physical Oceanography, University of Alaska,
Fairbanks, Alaska 99701.

3. ECONOMIC EFFECTS

R-237-74

EFFECTS OF OIL POLLUTION ON FISH EATING QUALITIES

Principal Investigator: Wood, P. C.
Performing Organization: Ministry of Agriculture, Burnham on Crouch, England
Supporting Agency: United Kingdom Government
Period: 7/72 to 6/73 Funds: Unknown

The work has been discontinued. Any similar work in the future will be carried out by the Ministry of Agriculture, Fisheries and Food Laboratory, Torry Research Station, Aberdeen.

Information Source: I. C. White, Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Remembrance Ave., Burnham on Crouch, Essex, England.

4. GENERAL EFFECTS

R-238-74

ENVIRONMENTAL IMPACT OF PETROLEUM EXPLORATION AND PRODUCTION ON GEORGES BANK

Principal Investigator: Knebel, H. J.
Performing Organization: U.S. Department of the Interior, Geological Survey, Woods Hole, Massachusetts 02543
Supporting Agency: U.S. Department of the Interior, Geological Survey, Geological Division, No. 9810-00973
Period: 7/72 to 6/73 Funds: Unknown

Reports and Publications

MOVEMENT AND EFFECTS OF SPILLED OIL OVER THE OUTER CONTINENTAL SHELF - INADEQUACY OF EXISTENT DATA FOR THE BALTIMORE CANYON TROUGH AREA

Knebel, H. J. 1974.
Geological Survey Circular 702. 17 p.

A deductive approach is used in an effort to determine and predict the movement and effects of spilled oil. While some factors that determine oil movement are adequately known (i.e. variations in the water's thermohaline structure and suspended matter distribution), other factors (i.e. insufficient wind and storm statistics and lack of quantitative understanding of the relationship between nontidal drift and its driving mechanisms) make spill movements and predictions unreliable.

RESPONSIBILITIES AND ENVIRONMENTAL CONCERNS OF THE U.S. GEOLOGICAL SURVEY IN THE BALTIMORE CANYON TROUGH AREA

Knebel, H. J., and N. Hardin. 1974.
Proceedings of the Outer Continental Shelf Conference and Workshop on Marine Environmental Implications of Offshore Oil and Gas Development in the Baltimore Canyon Region of the Mid-Atlantic Coast, College Park, Maryland, December 2-4, 1974.

The responsibilities of the U.S. Geological Survey as they are related to the continental shelf are summarized. Past and present UCGS studies in the Baltimore Canyon Trough are outlined.

Information Source: H. J. Knebel, U.S. Department of the Interior, Geological Survey, Office of Marine Geology, Bldg. B, Quissett Campus, Woods Hole, Massachusetts 02543.

D. OIL POLLUTION PREVENTION

1. OIL HANDLING

R-137-74
MARAD OILY WASTE STUDY 2-3602

Principal Investigators: Fruh, S. M., and R. R. Bertrand
Performing Organization: Esso Research and Engineering Co., Linden, New Jersey 07036
Supporting Agency: Frederic R. Harris, Inc.
Period: 7/73 to 6/74 Funds: Unknown

The Mar Ad-sponsored study entitled, "Port Collection and Separation Facilities for Oily Wastes," has been completed. To date, five volumes of findings have been published and are available through the National Technical Information Service (Accession No. COM-73-11967).

Reports

PORT COLLECTION AND SEPARATION FACILITIES FOR OILY WASTES: VOLUME 5. A COMPARATIVE ANALYSIS OF CONCEPTUAL SYSTEM PLANS FOR THE SURVEYED PORTS UNDER THE 'NO DISCHARGE', '1969 AMENDMENTS' AND 'NO SHEEN' CRITERIA

Forster, R. L., et al. 1973.
NTIS Report COM-74-10012/4WP Vol. 5, 470 p.

The report identifies the different wastes that are brought into selected ports by military shipping and provides estimates of waste quantities in the seas for 1975 and 1980. Designs for oil waste-handling facilities are presented and the roles of government and impact of shipping are evaluated.

Information Source: S. M. Fruh, Government Research Laboratory, Exxon Research and Engineering Company, P.O. Box 8, Linden, New Jersey 07036.

R-242-74
A STUDY ON PORT COLLECTION AND SEPARATION FACILITIES FOR OILY WASTE

Principal Investigator: Moyer, E.
Performing Organization: Frederick R. Harris, Inc., New York, New York 10017
Supporting Agency: U.S. Department of Commerce, Maritime Administration No. 035933
Period: 7/72 to 6/73 Funds: $645,393

Reports

PORT COLLECTION AND SEPARATION FACILITIES FOR OILY WASTES, VOLUME V

Forster, R. L., J. E. Moyer, and C. G. Papacosta. 1973.
Final Report to Supporting Agency 6/1/73 to 8/31/73.
Report No. MA-RD-900-74010

Identifications were made of types of oil wastes brought into selected ports by non-military shipping. Quantity estimates as they related to different (present and future) environmental laws were made. Conceptual designs with cost analysis were devised for oil waste handling and treatment in these selected ports. Governmental roles, shipping impact, and entrepreneurial viability were discussed.

Information Source: Frederick R. Harris, Inc., Consulting
Engineers, 300 East 42nd St., New York,
New York 10017.

2. WASTE WATER TREATMENT

R-156-74
ULTRAFILTRATION CONCEPT

Principal Investigator: Unknown
Performing Organization: Abcor Incorporated, Cambridge, Massachusetts 02139
Supporting Agency: U.S. Department of Transportation, Coast Guard, Contract No. 025449
Period: 7/73 to 6/74 Funds: Unknown

As a result of the research study, a 10 gpm system has been built and is presently undergoing preliminary shake-down tests.

Information Source: A. Gollan, Environmental Technology and Development, Walden Research Division of Abcor, Inc., 201 Vassar St., Cambridge, Massachusetts 02139.

3. RESEARCH

R-158-74
JOINT EPA-API COAST GUARD CONFERENCE ON PREVENTION AND CONTROL OF OIL SPILLS

Principal Investigator: Gould, J. R.
Performing Organization: American Petroleum Institute, Washington, D.C. 20006
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development No. 800597, 72P15971
Period: 7/73 to 6/74 Funds: Unknown

The conference was held in 1973 and the project is completed. The "Proceedings" of this conference is available from the American Petroleum Institute's Publications Section as publication No. 4172 ($15.00 per copy).

Information Source: J. R. Gould, Division of Environmental Affairs, American Petroleum Institute, 1801 K Street, Northwest, Washington, D.C. 20006.

R-163-74
SURFACE WATER MOVEMENTS IN NEW YORK HARBOR

Principal Investigator: Tyler, J.
Performing Organization: Long Island University, Graduate School, Greenvale, New York 11548
Supporting Agency: U.S. Department of Transportation, Coast Guard, Contract 038155
Period: 7/73 to 6/74 Funds: Unknown

Reports

A TECHNIQUE FOR PREDICTING THE MOVEMENT OF OIL SPILLS IN NEW YORK HARBOR

Lissauer, I. M. 1974.
Final Report, No. CER/DC-8/74, USCG-D-6-75. 59 p.

The following topics are reviewed in the report: New York Harbor experiments, factors determining the movement of oil spills, and potential oil pollution sites - Upper New York Bay.

A NUMERICAL MODEL FOR SIMULATION OF OIL SPREADING AND TRANSPORT AND ITS APPLICATION FOR PREDICTING OIL SLICK MOVEMENT IN BAYS

Wang, S., L-S. Hwang. 1974.
Final Report, No. USCG-D-22-75. NTIS Report AD-780 424/8WP.
115 p.

The paper reports the development of a computer model for simulating oil spreading and transport at the air-water interface. The model, able to predict the size, shape and movement of oil as a function of time after a spill originates, is a useful tool in directing effective control and cleanup activities once an oil spill occurs.

WIND DRIFT SURFACE CURRENTS AND SPREAD OF CONTAMINANTS IN SHELF WATERS

Gordon, A. L., and R. D. Gerard. 1973.
Final Report, No. USCG-D-5-75, Contract DOT-CG-23339-A. 65 p.

Oil spilt on the sea responds to the basic velocity field of the upper few meters of water. In an effort to better understand the fate and behavior of oil pollution, experiments were conducted from July, 1972 to February, 1973, to study the velocity field in the upper few meters of the water column in the area of Ambrose Tower. Methods used in the study are given.

Information Source: S. Broida , address unknown.

E. FATE OF OIL IN THE ENVIRONMENT

1. BIOLOGICAL DEGRADATION

R-062-74
BIOLOGICAL COUNTERMEASURES TO MITIGATE THE EFFECTS OF HAZARDOUS MATERIAL SPILLS

Principal Investigators: Armstrong, N., and T. H. Roush
Performing Organization: University of Texas, School of Engineering, Austin, Texas 78712
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 72P20581
Period: 7/72 to 6/73 Funds: $85,390

The project is approximately 50% completed and is due to end February, 1976. Progress reports have been submitted to the granting agency and one paper has been presented at the 1974 National Conference on Control of Hazardous Material Spills.

Reports

BIOLOGICAL COUNTERMEASURES FOR THE MITIGATION OF HAZARDOUS MATERIAL SPILLS

Armstrong, N. E., O. Wyss, E. F. Gloyna, and V. C. Behn. 1974.
Presented at the American Institute of Chemical Engineers Conference on Control of Hazardous Material Spills, August, 1974, San Francisco.

The objective of the study is to investigate the feasibility of using microbiological processes to mitigate hazardous material spills in water courses. Conclusions drawn from the early stages of the work indicate that biological countermeasures are potential countermeasures because of the following: effectiveness of microorganisms in removing certain hazardous spills, the existence of microorganisms which attack a variety of hazardous materials, the feasibility of deploying microorganisms in situ, and previous use of microorganisms to degrade oil in oil spills and treat industrial wastes.

Information Source: N. E. Armstrong, College of Engineering, University of Texas at Austin, Austin, Texas 78712.

R-073-74

NITROGEN AND PHOSPHORUS AS NUTRIENTS LIMITING BIODEGRADATION

Principal Investigator: Brock, T. D.
Performing Organization: University of Wisconsin, School of Agriculture, Madison, Wisconsin 53706
Supporting Agency: U.S. Department of the Interior, Office of Water Resource Research, No. A-054-WIS
Period: 7/73 to 6/74 Funds: $2,500

The project is an ongoing one with several publications resulting from the study. Research has been concerned with nutrient limitation of oil biodegradation in 25 oligotrophic lakes in northern Wisconsin. It has been found that, despite the presence of oil-degrading microorganisms in these systems, rates of hydrocarbon metabolism are severely nutrient limited.

Reports and Publications

TEMPERATURE AND NUTRIENT LIMITATION OF OIL BIODEGRADATION IN LAKE MENDOTA, WISCONSIN

Ward, D., and T. D. Brock
Summary of work completed.

In studies determining the rate at which microorganisms indigenous to surface waters of Lake Mendota were able to degrade oil, results indicated that the rate of oil degradation varied seasonally due to limitation by low temperature in spring and fall, and low nutrient availability during midsummer. Maximal oil degradation rates of microorganisms existed for about one month in late spring of the year.

CHARACTERIZATION AND ACTIVITY OF OIL-DEGRADING BACTERIA IN THE SURFACE WATERS OF LAKE MENDOTA, WISCONSIN

Ward, D. M. 1973.
M.S. Thesis, Department of Bacteriology, University of Wisconsin.

Summary not available.

TEMPERATURE AND NUTRIENT LIMITATION OF OIL BIODEGRADATION IN LAKE MENDOTA, WISCONSIN

Ward, D. M., and T. D. Brock. 1974.
American Society of Microbiology, Proceedings.

Summary not available.

FACTORS AFFECTING SEASONAL VARIATION IN OIL BIODEGRADATION RATES IN LAKE MENDOTA, WISCONSIN

Ward, D. M., and T. D. Brock. 1974.
Presented at 37th Annual Meeting of the American Society of Limnology and Oceanography, June 23-27, 1974.

Summary not available.

Information Source: D. Ward, Department of Bacteriology,
University of Wisconsin, 1550 Linden Dr.,
Madison, Wisconsin 53706.

R-080-74
NAVY ENVIRONMENT: MICROBIAL DEGRADATION OF PETROLEUM IN THE MARINE ENVIRONMENT

Principal Investigator: Colwell, R. R.
Performing Organization: University of Maryland, School of Agriculture, College Park, Maryland 20742
Supporting Agency: U.S. Department of Defense, Navy, DN 223667, Contract N-0014-67-A-0239-0027
Period: 7/73 to 6/74 Funds: $29,175

The project is currently active with several publications resulting from the study.

Reports and Publications

MICROBIAL DEGRADATION OF PETROLEUM IN THE MARINE ENVIRONMENT

Colwell, R. R., J. Walker, and J. Robinson. 1973.
Progress Report to Office of Naval Research, ONR Report ACR-189.

Marine and estuarine bacteria capable of utilizing hydrocarbons are being investigated, their seasonal distributions in Chesapeake Bay analyzed, and their petroleum degrading isolates identified and classified. Fungal isolates are also being identified. Other areas of study include bacterial taxonomy, ultrastructure, chemical composition and reaction to pressure.

MICROBIAL MOBILIZATION OF NUTRIENTS IN ESTUARIES

Colwell, R. R., J. D. Nelson, and J. D. Walker. 1974.
Second International Estuarine Research Conference, Myrtle Beach, South Carolina (in press).

Summary not available.

GROWTH OF DEEP-SEA BACTERIA ON A PETROLEUM-BASED MEDIUM AT AMBIENT AND IN SITU PRESSURE

Schwarz, J. R., J. D. Walker, and R. R. Colwell. 1974.
Development in Industrial Microbiology 15:239-249.

Summary not available.

DEGRADATION OF HYDROCARBONS AND "MODEL PETROLEUM" BY MICROORGANISMS FROM CHESAPEAKE BAY

Walker, J. D., and R. R. Colwell. 1974.
Seventh International Conference on Water Pollution Research, Paris, France. Advanced Water Pollution Research. (In Press)

Summary not available.

MERCURY-RESISTANT BACTERIA AND PETROLEUM DEGRADATION

Walker, J. D., and R. R. Colwell. 1974.
Applied Microbiology 27(1):285-287.

Oil extracted from water and sediment samples from Colgate Creek, Chesapeake Bay, Maryland, contained high levels of mercury. Mercury-resistant bacteria in the samples were able to degrade the oil to a significant degree.

MICROBIAL DEGRADATION OF MODEL PETROLEUM AT LOW TEMPERATURES

Walker, J. D., and R. R. Colwell. 1974.
Journal of Microbial Ecology 1:59-91.

Summary not available.

MICROBIAL ECOLOGY OF PETROLEUM UTILIZATION IN CHESAPEAKE BAY

Walker, J. D., and R. R. Colwell.
No citation given.

The numbers of petroleum degrading microorganisms measured in petroleum polluted and non-polluted waters appeared to be related to the concentration of oil present.

MICROBIAL PETROLEUM DEGRADATION: USE OF MIXED HYDROCARBON SUBSTRATES

Walker, J. D., and R. R. Colwell. 1974.
Applied Microbiology 27(6):1053-1060.

The microbial degradation potential for microorganisms is evaluated using gas-liquid chromatography on a mixed hydrocarbon substrate (SAE non-detergent motor oil). Other methods of determining the extent of microbial degradation of hydrocarbons are discussed.

EXTRACTION OF PETROLEUM HYDROCARBONS FROM OIL-CONTAMINATED SEDIMENTS

Walker, J. D., R. R. Colwell, M. C. Hamming, and H. T. Ford. 1974.
Bulletin of Environmental Contamination and Toxicology. (In Press)

Summary not available.

OTHER FACTORS DETERMINING LIFE EXPECTANCY OF MICROORGANISMS IN THE MARINE ENVIRONMENT

Walker, J. D., and L. G. Guarraia. 1974.
International Symposium on Discharge of Sewage from Sea Outfalls, London, England. (In Press)

Summary not available.

Abstracts (Summaries not available)

MICROBIAL ACTIVITIES IN THE ESTUARINE ECOSYSTEM

Colwell, R. R., J. F. Carney, T. Kaneko, J. D. Nelson, and J. D. Walker. 1974.
First Intersectional Congress of International Association of Microbiological Societies, Tokyo, Japan.

GROWTH OF DEEP-SEA BACTERIA ON A PETROLEUM-BASED MEDIUM AT AMBIENT AND IN SITU PRESSURE

Schwarz, J. R., J. D. Walker, and R. R. Colwell. 1973.
Society of Industrial Microbiology Newsletter 23(4):16.

HYDROCARBON DEGRADATION BY OCEAN SEDIMENT BACTERIA

Walker, J. D., J. J. Calomiris, and R. R. Colwell. 1974.
Abstracts of Annual Meeting of the American Society of
Microbiology, Chicago, Illinois. p. 64.

Information Source: R. R. Colwell, Division of Agricultural
Life Sciences, Department of Microbiology,
University of Maryland, College Park,
Maryland 20742.

R-084-74
NAVY ENVIRONMENT: BIOLOGICAL DEGRADATION OF PETROLEUM IN THE MARINE ENVIRONMENT

Principal Investigator: Fair, J.
Performing Organization: Houston Research Incorporated, Houston,
Texas 77012
Supporting Agency: U.S. Department of Defense, Navy DN223520,
Contract N00014-72-C-0471
Period: 7/72 to 6/73 Funds: $48,949

The projects for the Office of Naval Research have been completed.

Reports

THE BIOLOGICAL OXIDATION OF HYDROCARBONS

Fair, J. F. 1971.
Final Report, HR Project No. 7140

Work was initiated to determine the feasibility of using cell-free bacterial extracts for emulsifying and oxidizing petroleum hydrocarbons. The results of oxygen-uptake studies and total organic carbon analyses have indicated that cell-free extracts have greater emulsifying and oxidative effects than intact microbial cells.

BIODEGRADATION OF OIL

Sedita, S. J. 1973.
Technical Report

The study was conducted to determine the feasibility of using partially disrupted microorganisms in conjunction with intact cells to increase the oxidative degradation of hydrocarbons. Various combinations of organisms were tested to find cultures which were effective in degrading Bunker C residual fuel oil.

Information Source: J. H. Russell, Houston Research, Inc., 7705
South Loop East, Houston, Texas 77012.

R-086-74
NAVY ENVIRONMENT: ENZYMATIC REMOVAL OF OIL POLLUTANTS IN THE MARINE ENVIRONMENT

Principal Investigator: Friede, J. D.
Specialty: Biology
Performing Organization: Villanova University, School of Liberal Arts, Villanova, Pennsylvania 19085
Supporting Agency: U.S. Department of Defense, Navy DN223772, Contract N00014-73-C-0186
Period: 7/73 to 6/74 Funds: $15,000

The Navy project was just completed, with the contract period ending October 31, 1974.

Reports

THE ISOLATION AND CHEMICAL AND BIOLOGICAL PROPERTIES OF MICROBIAL EMULSIFYING AGENTS FOR HYDROCARBONS

Friede, J. D. 1974.
Final Report, November 1, 1972 - October, 1974, to Office of Naval Research. Contract No. N00014-73-C-0186, Project No. NR 306-089.

Several techniques for partial fractionating were used on the emulsifying agents produced by two Candida strains and one Pseudomonas strain. Various difficulties were encountered obtaining samples from the Candida strains; however, two of the components obtained from Pseudomonas appeared to be relatively simple in composition. Emulsifying agent production did not appear to be a specific response and it was concluded that emulsifiers might be fragments of overproduced cell components or fragments extracted from the cell by hydrocarbons.

Information Source: J. D. Friede, Villanova University, Villanova, Pennsylvania 19085.

R-216-74
THE MICROBIAL DEGRADATION OF AROMATIC HYDROCARBONS

Principal Investigator: Gibson, D. T.
Microbiology
Performing Organization: University of Texas, School of Natural Sciences, Austin, Texas 78712
Supporting Agency: Robert A. Welch Foundation
Period: 7/73 to 6/74 Funds: $15,000

Reports and Publications

BACTERIAL METABOLISM OF PARA- AND META-XYLENE: OXIDATION OF A METHYL SUBSTITUTE

Davey, J. F., and D. T. Gibson. 1975.
Journal of Bacteriology 119(3):923-929.

The isolation and identification of 3- and 4-methylcatechol as intermediates in the bacterial (*Pseudomonas pxy*) degradation of *m*- and *p*-xylene, respectively, are described.

THE MICROBIAL DEGRADATION OF AROMATIC PETROLEUM PRODUCTS

Gibson, D. T. 1974.
Annual Report No. 1, Office of Naval Research, Contract N00014-67-A-0126-0020. Task No. NR 306-054. 63 p.

Efforts to investigate the mechanisms utilized by soil bacteria (*Pseudomonas* sp.) to oxidize *ortho*-, *meta*- and *para*-xylene are described.

INITIAL REACTIONS IN THE OXIDATION OF ETHYLBENZENE BY PSEUDOMONAS PUTIDA

Gibson, D. T., B. Gschwendt, W. K. Yeh, and V. M. Kobal. 1973.
Biochemistry 12(8):1520-1528.

Oxygenation of ethylbenzene is reported to occur at positions 2 and 3 of the aromatic nucleus in an analogous manner to that reported for toluene and its parahalogenated derivatives. Also described is the minor metabolic pathway involving initial oxidation of the side chain.

BACTERIAL METABOLISM OF PARA- AND META-XYLENE: OXIDATION OF THE AROMATIC RING

Gibson, D. T., V. Mahadevan, and J. F. Davey. 1974.
Journal of Bacteriology 119(3):930-936.

Described are the isolation and identification of the initial oxidation products formed from *p*- and *m*-xylene by *Pseudomonas putida* 39/D, a mutant strain known to oxidize several different aromatic hydrocarbons to *cis*-dihydrodiols.

Information Source: D. T. Gibson, The University of Texas at
Austin, Austin, Texas 78712.

2. GENERAL

R-160-74

FATE OF OIL IN A WATER ENVIRONMENT - A REVIEW, EVALUATION AND BIBLIOGRAPHY OF LITERATURE

Principal Investigator: Kolpack, R. L.
Performing Organization: University of Southern California,
Graduate School, Los Angeles,
California 90007
Supporting Agency: American Petroleum Institute
Period: 7/73 to 6/74 Funds: $100,000

The project is in the second phase of development and no publications are presently available.

Information Source: R. L. Kolpack, University of Southern
California, Environmental Geology Program,
Los Angeles, California 90007.

F. LEGAL ASPECTS OF OIL POLLUTION

R-244-74
LEGAL REPRESENTATION OF CITIZEN'S INTERESTS IN ENVIRONMENTAL PROTECTION

Principal Investigator: Unknown
Performing Organization: Environmental Defense Fund, Riverhead, New York
Supporting Agency: Ford Foundation
Period: 7/72 to 6/73 Funds: Unknown

The Environmental Defense Fund is a small coalition of lawyers and scientists who seek the enforcement of environmental protection laws and regulations through court action based on scientific research. The Defense Fund has not been involved in any cases involving oil spill events nor produced any oil pollution research.

Information Source: N. H. Watson, Environmental Defense Fund,
162 Old Town Road, East Setauket, New York 11733.

SECTION III. CURRENT RESEARCH PROJECTS

A. OIL POLLUTION DETECTION AND EVALUATION

1. MONITORING

R-245-74
FATE, SPATIAL AND TEMPORAL DISTRIBUTION OF PETROLEUM DERIVED ORGANIC COMPOUNDS

Principal Investigator: Anderson, J. W.
Performing Organization: Texas A & M University System,
Center for Marine Resources, College
Station, Texas 77843
Supporting Agency: IDOE
Period: 3/73 to 2/75 Funds: $103,000

The study's objective is to determine levels of light hydrocarbons in the ocean and coastal zone and relate them to petroleum inputs from harbor and Gulf oil operations. The toxic effects of a range of specific hydrocarbons on selected marine and estuarine organisms will also be studied.

Biological effects of oil pollution

Information Source: Author.

R-246-74
MONITORING CONTAMINANTS (PESTICIDES, HERBICIDES, HEAVY METALS) IN FRESHWATER AND MARINE FISHES OF ALASKA

Principal Investigators: Merrell, T. R., and H. Sears
Performing Organization: U.S. Department of Commerce, Auke Bay
Fisheries Laboratory, P.O. Box 155,
Auke Bay, Alaska 99821
Supporting Agency: U.S. Department of Commerce, National
Oceanic and Atmospheric Administration,
National Marine Fisheries Service, No. 28189072
Period: 7/72 to 6/73 Funds: $38,000

The aim of the study is to monitor contaminant levels in Alaskan fishes. As a part of the research effort, areas having natural oil seeps have been catalogued through consultation and literature surveys.

SSIE No.: ZBP-401.

2. REMOTE SENSING

R-010-74 (Renewal)
OIL SPILL SURVEILLANCE SYSTEM

Principal Investigator: Eldering, H. G.
Performing Organization: Baird Atomic Incorporated, Bedford, Massachusetts
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 68-01-0146. Contract 72P20868
Period: 7/74 to 6/75 Funds: Unknown

The project proposes to develop a prototype fluorescence oil spill surveillance instrument based on fluorescence excitation/emission signatures and emission efficiency data on model oils.

SSIE No.: GMA-1630-2.

3. ANALYSIS

R-247-74
ATMOSPHERIC POLLUTANT TRANSPORT AND DEPOSITION ON THE SEA SURFACE

Principal Investigator: Duce, R. A.
Oceanography
Performing Organization: University of Rhode Island, School of Oceanography, Administration Building, Kingston, Rhode Island 02881
Supporting Agency: U.S. National Science Foundation, Division of National and International Programs
Period: 2/75 to 1/76 Funds: $154,550

Atmospheric samples and seawater samples from the surface microlayer from areas near Bermuda, Hawaii and American Samoa will be analyzed for heavy metals, petroleum hydrocarbons and chlorinated hydrocarbons in an effort to measure atmospheric transport of pollutants to open ocean surfaces.

SSIE No.: GSN-949-3.

R-026-74 (Renewal)
THE FEASIBILITY OF IDENTIFYING MYSTERY OIL SPILLS

Principal Investigator: Hunt, G. S.
Performing Organization: State Department of Environmental Protection, Augusta, Maine
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 801006
Period: 7/74 to 6/75 Funds: Unknown

A feasibility study is being conducted to determine whether oil spilled in coastal and inland waters can be identified. Samples of spills will be compared chemically and physically with oil samples taken from ships (oil from ships sampled in accordance with the State of Maine's Oil Conveyance Law).

SSIE No.: GMA-1646-2.

R-248-74
STUDY TO CONDUCT A NATIONAL ASSESSMENT OF NONPOINT POLLUTION

Principal Investigators: McElroy, A. D., J. W. Nelogen, and S. Y. Chiu
Performing Organization: Midwest Research Institute, 425 Volker Blvd., Kansas City, Missouri 64110
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development

A quantitative nation-wide assessment of nonpoint pollution from various significant sources will be compiled. Oil is included in the pollutants to be studied.

SSIE No.: GMA-1834.

R-249-74
EXTRACTION OF ORGANIC COMPOUNDS FROM NATURAL WATERS

Principal Investigators: Wasik, S. P., and R. N. Boyd
Performing Organization: U.S. Department of Commerce, National Bureau of Standards, Washington, D.C. 20234
Supporting Agency: U.S. Department of Commerce, National Bureau of Standards, Washington. D.C., No. 3160141
Period: 7/74 to 6/75 Funds: $35,000

An analytical method has been developed for the determination of hydrocarbons in the marine environment. This technique will facilitate determination of solubilities and partition coefficients of hydrocarbons in natural waters, sediments, fish slime and plankton.

SSIE No.: ZBA-6173.

R-250-74
ANALYTICAL PHYSICAL MODEL

Principal Investigator: White, F. M.
Ocean Engineering
Performing Organization: University of Rhode Island, School of Engineering, Administration Building, Kingston, Rhode Island 02881
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Sea Grant Office
Period: 7/74 to 6/75 Funds: $7,315

The objectives of the project for 1974-75 are: to extend a new finite element model to prediction of pollutant diffusion in Narragansett Bay, and to continue efforts to develop a new model of sediment transport in coastal waters. Simulation of oil-spill movements in the Bay was one of the previous applications of analytical physical models.

SSIE No.: GBP-49-4.

B. OIL POLLUTION CONTROL

1. CONTAINMENT

R-251-74
WAVE EFFECTS ON THE CONTAINMENT AND COLLECTION OF OIL SLICKS

Principal Investigator: Milgram, J. H.
Performing Organization: Massachusetts Institute of Technology, School of Engineering, Cambridge, Massachusetts 02139
Supporting Agency: U.S. National Science Foundation, Divison of Engineering, Eng 72-03943 A03
Period: 10/74 to 3/76 Funds: $44,300

Research areas of a study on fluid dynamics of oil slicks include the following: low turbulence flume construction; the effects of waterwaves on oil slick transport and barrier contained oil slick geometry in a current; and barrier contained oil slick interfacial stability in a current.

SSIE No.: GSE-4654-1.

2. CLEANUP AND RECOVERY

R-054-74 (Renewal)
JOINT API-EPA-USCG CONFERENCE ON PREVENTION AND CONTROL OF OIL SPILLAGE

Principal Investigator: Gould, J. R.
Performing Organization: American Petroleum Institute, Washington, D.C. 20006
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 800597, 72P19571
Period: 7/74 to 6/75 Funds: Unknown

A three-day conference is to be convened to deal with the following: prevention, containment, harvesting, cleanup, and fate and behavior of oil in water.

SSIE No.: GMA-1666-2.

R-252-74
OIL SKIMMING

Principal Investigators: Grutsch, J. F., and R. C. Mallatt
Performing Organization: Standard Oil Co. of Indiana, 200 E. Randolph Dr., Chicago, Illinois 60601
Supporting Agency: Standard Oil Co. of Indiana
Period: 1/74 to 1/75 Funds: Unknown

A special vortex generator which collects oil on the surface of water is being used in a project to provide improved collecting and skimming methods for oil recovery. A prototype has been constructed.

SSIE No.: AW-540.

R-253-74
PHASE REMOVAL PROCESS

Principal Investigators: Grutsch, J. F., and R. C. Mallatt
Performing Organization: Standard Oil Co. of Indiana, 200 E. Randolph Dr., Chicago, Illinois 60601
Supporting Agency: Standard Oil Co. of Indiana
Period: 1/74 to 1/75 Funds: Unknown

A proprietary apparatus, incorporating a novel design and providing improved oil and solid separation from water, is being investigated. The apparatus has been constructed.

SSIE No.: AW-538.

R-254-74

DEMONSTRATION OF NEW OIL SPILL REMOVAL EQUIPMENT

Principal Investigator: Trentacoste, N. P.
Performing Organization: JRB Associates Incorporated, 1701 N. Fort Myer Dr., Arlington, Virginia 22209
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 68-03-0327, Contract 72P21699
Period: 7/74 to 6/75 Funds: Unknown

A method of picking up oil on water is being developed in which a directed air jet is used to create an oil/water spray. The spray is directed toward a rotating belt of hydrophobic, oleophilic polyurethane foam from which the oil is squeezed.

SSIE No.: GMA-1721-1.

R-254-74

TEST AND EVALUATION PROGRAM OF A NOVEL HIGH VELOCITY OIL SLICK SKIMMER

Principal Investigator: Unknown
Performing Organization: Hydronautics Incorporated, 7210 Pindell School Rd., Laurel, Maryland 20810
Supporting Agency: U.S. Department of Transportation, Coast Guard
Period: 7/73 to 6/74 Funds: $21,460

An evaluation program is being conducted on a novel high velocity oil slick skimmer developed by Hydronautics.

SSIE No.: GZ-48617.

C. EFFECTS OF OIL POLLUTION

1. BIOLOGICAL

R-255-74
FIELD STUDIES OF EFFECTS OF OIL ON MARINE ORGANISMS

Principal Investigator: Anderson, J. W.
Performing Organization: Texas A & M University System, Center for Marine Resources, College Station, Texas 77843
Supporting Agency: American Petroleum Institute
Period: 3/74 to 12/75 Funds: $234,000

The chronic effects of petroleum hydrocarbons on marine organisms have been studied, and an additional phase of research will be conducted to determine the effects of contamination on organism populations at various distances from a contamination source in Galveston Bay. Water, sediment and tissue samples will be carefully analyzed for hydrocarbon characteristics.

Information Source: Author.

R-256-74
AQUATIC ECOLOGICAL STUDIES IN MACKENZIE-PORCUPINE RIVER WATERSHED WITH SPECIAL REFERENCE TO GAS AND OIL PIPELINE DEVELOPMENT

Principal Investigators: Brunskill, G., R. Wageman, N. B. Snow, and D. M. Rosenberg
Performing Organization: Canadian Department of the Environment, Winnipeg, Manitoba, Canada
Supporting Agency: Canadian Government, Department of the Environment
Period: 7/74 to 6/75 Funds: Unknown

"To assist the Federal Government in assessing application for pipeline, effects of highway, and other pipeline related construction and operation; to assess ranges of variation of benthic organism abundances, biomasses, and productivity; to assess ranges of variation of physical and chemical parameters that influence the growth and reproduction of aquatic organisms."

SSIE No.: AK-69-3.

R-257-74
BENTHIC BIOLOGY OF PORT VALDEZ

Principal Investigators: Feder, H. M., and G. Mueller
Performing Organization: University of Alaska, Institute of Marine Sciences, Fairbanks, Alaska 99701
Supporting Agency: University of Alaska
Period: 7/74 to 6/75 Funds: Unknown

"Baseline data on benthic biology"

SSIE No.: AW-795.

R-085-74 (Renewal)
THE SEDIMENT ENVIRONMENT OF PORT VALDEZ AND GALENA BAY, ALASKA AND THE EFFECT OF OIL ON THIS ECOSYSTEM

Principal Investigator: Feder, H. M.
Performing Organization: University of Alaska, School of Biological Sciences, College, Alaska
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 800944, 72P00621
Period: 7/74 to 6/75 Funds: Unknown

The project proposes to obtain baseline information concerning the mudflat ecosystems of Port Valdez and Galena Bay by studying the biological, physical, and chemical characteristics of the sediments. The effects of Prudhoe Bay crude oil on these parameters will then be examined.

Physical effects of oil pollution
Chemical effects of oil pollution

SSIE No.: GMA-1548-2.

R-258-74
MICROCONSTITUENT

Principal Investigators: Knobl, G. M., B. R. Stillings, and M. A. Steinberg
Performing Organization: U.S. Department of Commerce, Fisheries Production Technical Laboratory, Regents Dr., College Park, Maryland 20740
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service

Period: 7/73 to 6/74 Funds: $615,000

Research efforts have been initiated to provide comprehensive data on the occurrence and public health significance of microconstituents, such as heavy metals, inorganic trace elements, pesticides and PCB's, in fish and fishery products. Future work will assess the effects of petroleum hydrocarbons on the fisheries products.

SSIE No.: ZBP-536.

R-096-74 (Renewal)
THE EFFECTS OF ENVIRONMENTAL STRESS ON THE COMMUNITY STRUCTURE AND PRODUCTIVITY OF SALT MARSH EPIPHYTIC COMMUNITIES

Principal Investigators: Lee, J. J., W. A. Muller, M. McEnery, J. Garrison, E. Kennedy, and H. Rubin
Specialty: Biology
Performing Organization: City University of New York, Graduate School, New York, New York
Supporting Agency: U.S. Atomic Energy Commission, Biomedical and Environmental Research Divison, Ber-75-263 No. AT(11-1)3254 CODE AA
Period: 9/74 to 8/75 Funds: $50,600

The subtle variables which regulate the microbial and micrometazoan assemblages within metropolitan region New York salt marshes and shallow embayments will be defined and analyzed. Food chain assessments will be made and environmental stress (including petrochemical) experiments and water quality assays will be conducted.

SSIE No.: GPE-1694-6.

R-097-74 (Renewal)
CHEMICAL-BIOLOGICAL FOLLOW-UP STUDY ON THE SCHUYKILL RIVER OIL SPILL

Principal Investigator: Mainville, C.
Performing Organization: Ocean Science and Engineering, Inc., Rockville, Maryland 20852
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 68-01-0781, 72P20311
Period: 7/74 to 6/75 Funds: Unknown

The effects of the 1972 Schuykill River oil spill are being determined by studying riverbank vegetation and analyzing aquatic communities and fish for oil components (heavy metals and polycyclic aromatic hydrocarbons, respectively).

SSIE No.: AO-20311-2.

R-259-74
SUBLETHAL BIOCHEMICAL EFFECTS OF CONTAMINANTS

Principal Investigator: Malins, D. C.
Performing Organization: Northwest Fisheries Center, 2725 Montlake Blvd., East Seattle, Washington 98112
Supporting Agency: Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service
Period: 7/74 to 6/75 Funds: Unknown

Petroleum hydrocarbons are among the contaminants being studied in an effort to determine the retention, penetration, and transport of contaminants in marine organisms. The effects of oil penetration in these animals are to be examined.

SSIE No.: Private Source.

R-110-74 (Renewal)
BIOLOGICAL RECOVERY FOLLOWING AN OIL SPILL

Principal Investigator: Sanders, H. L.
Performing Organization: Woods Hole Oceanographic Institution, Woods Hole, Massachusetts
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 801001
Period: 7/74 to 6/75 Funds: Unknown

Biological and sediment samples were collected and analyzed for oil following two oil spills off West Falmouth, Massachusetts, in September, 1969. Such data are being used to provide information on the effects and subsequent recovery of marine organisms following oil spills.

Analysis

SSIE No.: GMA-832-2.

R-260-74
NAVY ENVIRONMENT: BIOLOGY OF THE MARINE ENVIRONMENT

Principal Investigators: Vedros, N. A., and A. B. Cobet
Performing Organization: University of California, School of Public Health, Berkeley, California 94720
Supporting Agency: U.S. Department of Defense, Navy, No. DN023238 Contract N00014-69-A-0222-1001
Period: 7/74 to 6/75 Funds: $100,000

Hydrocarbon uptake by marine organisms will be one of several areas of emphasis in a study of the ecological impact of pollutants on marine and terrestrial environments.

SSIE No.: GQN-23238-1.

2. PHYSICAL

R-124-74 (Renewal)
MEASUREMENT AND MOLECULAR INTERPRETATION OF SURFACE SHEAR VISCOSITY

Principal Investigator: Goodrich, F. C.
Specialty: Chemistry
Performing Organization: Clarkson College of Technology, School of Arts, Potsdam, New York
Supporting Agency: U.S. National Science Foundation, Division of Mathematics and Physical Sciences, GP-29612A#1
Period: 5/74 to 4/75 Funds: $20,500

The relationship between surface viscosity and the size, shape, and the conformation of molecules adsorbed at liquid/air and liquid/liquid interfaces will be investigated with an original design viscometer.

SSIE No.: GSP-8997-1.

D. OIL POLLUTION PREVENTION

1. DESIGN AND ENGINEERING

R-261-74
CORPS POLICY AND PROCEDURES ON DEEPWATER PORT ANALYSIS

Principal Investigators: Harrison, R. W., and R. L. Trisko
Performing Organization: U.S. Army, Engineer Institute for Water Research, Kingman Bldg., Fort Belvoir, Virginia 22060
Supporting Agency: U.S. Department of Defense, Army Corps of Engineers, No. 31067
Period: 7/73 to 6/74 Funds: Unknown

A joint research project has been initiated to analyze the economic benefits and costs of alternative deepwater port designs for use in petroleum delivery terminals, and to consider the environmental and social aspects of equipment design and operating standards.

SSIE No.: ZTK-508.

2. WASTE WATER TREATMENT

R-262-74
REFINERY EFFLUENT TREATMENT: ENGINEERING PROCESS DESIGN

Principal Investigators: Grutsch, J. F., and R. C. Mallatt
Performing Organization: Standard Oil Co. of Indiana, 200 E. Randolph Dr., Chicago, Illinois 60601
Supporting Agency: Standard Oil Co. of Indiana
Period: 1/75 to 1/76 Funds: Unknown

Proprietary process designs are being developed to improve the performance and effectiveness of existing waste treatment processes.

SSIE No.: AW-542.

R-263-74
EXPERIMENTAL PROTOTYPE OILY WATER SEPARATOR SYSTEM

Principal Investigator: Holt, B.
Performing Organization: Ben Holt Company, Pasadena, California 91101
Supporting Agency: U.S. Department of Defense, Navy
Period: 7/73 to 6/74 Funds: $56,194

A 20 GPM experimental prototype transportable three stage oily waste water treatment system is being designed, built and tested.

SSIE No.: GQN-487037.

R-264-74
IDENTIFICATION OF POLLUTANTS IN PETROLEUM REFINERY WASTEWATERS AFTER ACTIVATED SLUDGE TREATMENT

Principal Investigator: Keith, L. H.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, Corvallis, Oregon 97330
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 07 ABL 04 72P18094
Period: 7/74 to 6/75 Funds: Unknown

Qualitative and quantitative analyses will be made on specific organic pollutants in petroleum refinery wastewater before, during and after all phases of biological treatment (activated sludge). Identified compounds will be listed in computer libraries and this information will be used in programs of surveillance analysis, treatment effectiveness evaluation, and in establishing effluent criteria.

SSIE No.: AO-18094-1.

3. PERSONNEL TRAINING AND EDUCATION

R-265-74
OIL AND OTHER HAZARDOUS MATERIALS IN THE ENVIRONMENT

Principal Investigator: Cruickshank, A. M.
Specialty: Chemistry
Performing Organization: University of Rhode Island School of Arts, Administration Bldg., Kingston, Rhode Island 02881
Supporting Agency: U.S. Environmental Protection Agency, No. 802601 72P21519
Period: 7/74 to 6/75 Funds: Unknown

This project will provide partial support for foreign visitors to participate in a conference on oil and hazardous materials.

SSIE No.: GMA-1740-1.

4. RESEARCH

R-266-74
ASSESSMENT OF DAMAGE DUE TO OIL SPILLS

Principal Investigator: Enk, G. A.
Performing Organization: Institute on Man and Science, Rensselaerville, New York 12147
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 802619 72P21520
Period: 7/74 to 6/75 Funds: Unknown

The components of a systematic approach to damage assessment of oil spills will be presented and analyzed. The three phases of the project will be: a broad range literature survey and review; the presentation of a multidisciplinary oil spill symposium; and publication and dissemination of the study findings.

SSIE No.: GMA-1741-2.

R-159-74 (Renewal)
WATER QUALITY STUDY OF MONTAUK HARBOR, LONG ISLAND, NEW YORK, USING A HYDRAULIC MODEL

Principal Investigators: Hunt, J. P., and T. Omholt
Performing Organization: New York Ocean Science Lab., Montauk, New York
Supporting Agency: New York Ocean Science Lab.
Period: 7/74 to 6/75 Funds: Unknown

Velocity patterns and dispersion and diffusion of foreign substances (including petroleum products) are being studied on a distorted model of Montauk Harbor in order to help predict the results of future harbor-related activities and developments.

SSIE No.: AL-984-2.

E. FATE OF OIL IN THE ENVIRONMENT

1. BIOLOGICAL DEGRADATION

R-073-74 (Renewal)
NITROGEN AND PHOSPHORUS AS NUTRIENTS LIMITING BIODEGRADATION

Principal Investigator: Brock, T. D.
Specialty: Bacteriology
Performing Organization: University of Wisconsin, School of Agriculture, Madison, Wisconsin
Supporting Agency: U.S. Department of the Interior, Office of Water Resource Research, No. A-054-WIS
Period: 7/74 to 6/75 Funds: $10,000

Research will be conducted on the roles of nitrogen and/or phosphorus as limiting nutrients in the oxidation of oil and some of its components by surface water microorganisms in Lake Mendota. Resulting information will be used in predicting levels of oil tolerable to given freshwater systems.

SSIE No.: GUW-3943-1.

R-074-74 (Renewal)
FATE AND EFFECT OF OIL IN THE ENVIRONMENT OF THE COASTAL GULF OF MEXICO

Principal Investigator: Brown, L. R.
Specialty: Microbiology
Performing Organization: Mississippi State University School of Arts, State College, Mississippi
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, 68-01-0745 72P19734
Period: 7/74 to 6/75 Funds: Unknown

A field and laboratory study of the fate of crude oil in the marine environment of coastal Gulf waters is being conducted. The study effort will include chronic effect assessment and ecosystem recovery.

SSIE No.: AO-19734-2.

R-267-74
MICROBIAL AND INSECT METABOLISM OF ALIPHATIC COMPOUNDS

Principal Investigator: Markovetz, A. J.
Specialty: Microbiology
Performing Organization: University of Iowa, School of Medicine, Jessup Hall, Iowa City, Iowa 52240
Supporting Agency: U.S. Department of Health, Education and Welfare, Public Health Service, National Institutes of Health, National Institute of General Medical Science
Period: 9/74 to 8/75 Funds: $18,528

Efforts are being made to establish a catabolic pathway on an enzymatic level for subterminal oxidation of aliphatic hydrocarbons by microorganisms and to determine if the process is operative in insects and mediated by symbiotic microorganisms.

SSIE No.: 1GM-19809-3.

R-099-74 (Renewal)
THE IMPACT OF MICROORGANISMS ON OIL

Principal Investigator: Meyers, S. P.
Performing Organization: Louisiana State University, School of Agriculture, Baton Rouge, Louisiana
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 800993, 72P14726
Period: 7/74 to 6/75 Funds: Unknown

The role of microorganisms in oil-contaminated sediment will be studied. Emphasis will be placed on finding hydrocarbon pollution indicator species and species that can be introduced to accelerate oil biodegradation.

Cleanup and recovery

SSIE No.: AO-14726-2.

F. LEGAL ASPECTS OF OIL POLLUTION

R-244-74 (Renwal)
LEGAL REPRESENTATION OF CITIZEN'S INTERESTS IN ENVIRONMENTAL PROTECTION

Principal Investigator: Comeron, R.
Performing Organization: Environmental Defense Fund, Riverhead, New York
Supporting Agency: Ford Foundation
Period: 7/73 to 12/74 Funds: $300,000

Legal and scientific work will be done in several areas of environmental protection including oil pollution.

SSIE No.: QY-1575-3.

R-268-74
POLLUTION CONTROL - LEGAL INCENTIVE

Principal Investigators: Irwin, W. A., and R. H. Abel
Performing Organization: Environmental Law Institute, 1346 Connecticut Ave., N.W., Washington, D.C. 20036
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development
Period: 7/74 to 6/75 Funds: Unknown

The potential use of current local, state, or federal laws containing economic incentive mechanisms will be evaluated for amendment to federal laws governing environmental quality.

SSIE No.: AO-21628-1.

SECTION IV. PATENTS

A. UNITED STATES PATENTS

P-112-74
REMOVAL OF DISSOLVED OR SUSPENDED SOLIDS IN WASTE WATER

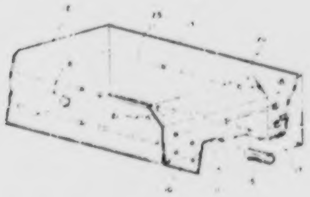
Anderson, H. T.

U.S. Patent 3,816,274

A treatment method is described which separates greasy matter from an emulsified water-fat solution.

Citation Source: Selected Water Resources Abstracts. 1974. 7(23). Entry # W74-12449.

3,816,274
REMOVAL OF DISSOLVED OR SUSPENDED SOLIDS IN WASTE WATER
Harry T. Anderson, Clarendon Hills, Ill., assignor to Swift & Company, Chicago, Ill.
Filed Oct. 20, 1971, Ser. No. 191,008
Int. Cl. C02b *1/82*, C02c *5/12*, B01k *3/00*
U.S. Cl. 204—149 7 Claims



P-113-74

DEVICE FOR RECOVERING FLOATING MATTER FROM WATER SURFACE

Reproduced from
best available copy.

Aramaki, K., H. Kawakami, and Y. Kawaguchi

U.S. Patent 3,812,968

An apparatus for recovering floating matter from surface water is composed of a floating frame body, a bucket directed toward, and an absorptive feeder which is secured to the frame body. The feeder moves along a closed loop extending above the water's surface and feeds floating matter to an inlet opening in the bucket.

Citation Source: Selected Water Resources Abstracts. 1974. 7(23). Entry # W74-12432.

3,812,968

DEVICE FOR RECOVERING FLOATING MATTER FROM WATER SURFACE

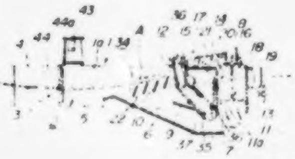
Kuninori Aramaki, Yokohama; Hiroshi Kawakami, Kamakura, and Yasuharu Kawaguchi, Yokohama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed June 6, 1973, Ser. No. 367,617

Claims priority, application Japan, June 10, 1972, 47-57321; July 26, 1972, 47-74799

Int. Cl. B01d *35/02*

U.S. Cl. 210—242 **7 Claims**



P-114-74
OIL SLICK REMOVAL METHOD, SYSTEM AND BAG THEREFOR

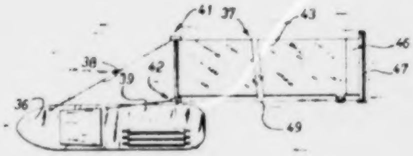
Avey, R. L.

U.S. Patent 3,796,656

The method consists of deployment of large plastic bags in a horizontal arrangement on the water surface so that the bags envelop an oil slick floating on the body of water. When the bags are released, the mouth of the bag, which is weighted, hangs in a downward position in the water and the oil collects at the top of the closed bag where it is then removed.

Citation Source: Selected Water Resources Abstracts. 1974. 7(21). Entry # W74-11055.

3,796,656
OIL SLICK REMOVAL METHOD, SYSTEM AND BAG THEREFOR
Reginald L. Avey, 39 Sunny Acres,
Baie d'Urfe, Quebec, Canada
Filed Dec. 29, 1971, Ser. No. 213,668
Int. Cl. B01d *37/00;* **E02b** *15/04*
U.S. Cl. 210—65 **9 Claims**



P-115-74
FLOATING ANTIPOLLUTION BARRIER DEVICE

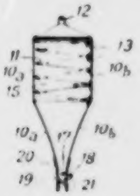
Ballu, L.

U.S. Patent 3,811,285

A floating barrier is described as a water pollution control structure, consisting of a submerged skirt supported by floating devices arranged in a two-walled structure.

Citation Source: Selected Water Resources Abstracts. 1974. 7(21).
Entry # W74-11060.

3,811,285
FLOATING ANTI-POLLUTION BARRIER DEVICE
Louis Ballu, Colombes, France, assignor to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes, Paris, France
Filed June 9, 1972, Ser. No. 261,410
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **24 Claims**



P-116-74
FLOATING BARRIER

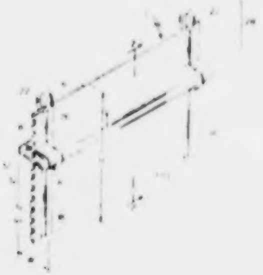
Benson, R. A.

U.S. Patent 3,818,708

Described is a floating barrier for use in oil spill containment. The barrier is comprised of a solid vertical dam with floats extending the length of the barrier to provide maximum strength and continuity, and vertical stiffening ribs to provide rigidity.

Citation Source: Selected Water Resources Abstracts. 1975. 8(2).
Entry # W75-01049.

3,818,708
FLOATING BARRIER
Robert A. Benson, Cohasset, Mass., assignor to Submarine Engineering Associates, Inc., Cohasset, Mass.
Filed Feb. 2, 1972, Ser. No. 222,867
Int. Cl. E02b 15/04
U.S. Cl. 61—1 F **12 Claims**



P-117-74

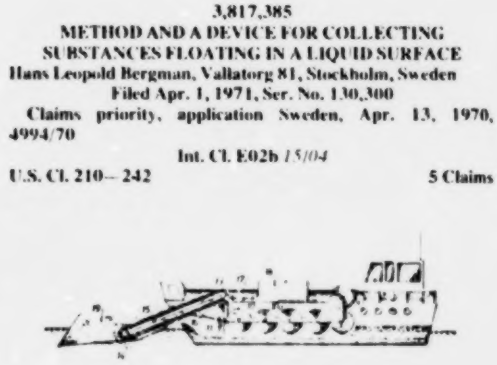
METHOD AND A DEVICE FOR COLLECTING SUBSTANCES FLOATING IN A LIQUID SURFACE

Bergman, H. L.

U.S. Patent 3,817,385

The collecting device is composed of an endless conveyor run around rollers which extends from a point in the water to a location adjacent to a collecting table carried on board a ship. This arrangement makes possible the transfer of pollutant material carried by the conveyor to a collecting receptacle.

Citation Source: Selected Water Resources Abstracts. 1974. 7(23).
Entry # W74-12446.



3,817,385
METHOD AND A DEVICE FOR COLLECTING
SUBSTANCES FLOATING IN A LIQUID SURFACE
Hans Leopold Bergman, Vallatorg 81, Stockholm, Sweden
Filed Apr. 1, 1971, Ser. No. 130,300
Claims priority, application Sweden, Apr. 13, 1970, 4994/70
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 5 Claims

P-118-74

SURFACE TENSION METHOD OF AND APPARATUS FOR SEPARATING IMMISCIBLE LIQUIDS

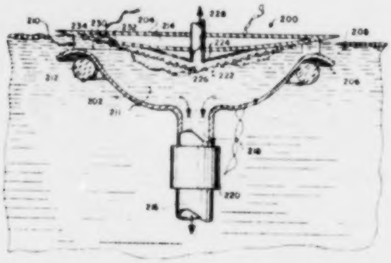
Bhuta, P. G., R. L. Johnson, and D. J. Graham

U.S. Patent 3,831,756

Surface tension liquid screening action is the principle used in a liquid separation apparatus for separating a selected liquid from a second liquid in which the former liquid is immiscible.

Citation Source: Selected Water Resources Abstracts. 1975. 8(2).
Entry # W75-01034.

3,831,756
SURFACE TENSION METHOD OF AND APPARATUS FOR
SEPARATING IMMISCIBLE LIQUIDS
Pravin G. Bhuta, Torrance; Robert L. Johnson, Marina Del Rey, and Douglas J. Graham, Redondo Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Division of Ser. No. 50,640, June 29, 1970, Pat. No. 3,703,463. This application Sept. 13, 1972, Ser. No. 288,593The portion of the term of this patent subsequent to Nov. 21, 1989, has been disclaimed.
Int. Cl. B01d *21/00*
U.S. Cl. 210—109 **1 Claim**



P-119-74

OIL SPILL RECOVERY

Clampitt, B. H., K. E. Harwell, and J. W. Jones, Jr.

U.S. Patent 3,819,514

Ethylene-methyl methacrylate copolymer foam was reported to have a high capacity for absorbing oil floating on water. Tests demonstrated the absorption capacity of the foam to be greater than seven times its weight of crude oil.

Citation Source: Chemical Abstracts. 1974. 81(26). Entry #170753n.

P-120-74

OIL SKIMMER MODULE WITH FREE FLOATING WEIR TROUGH

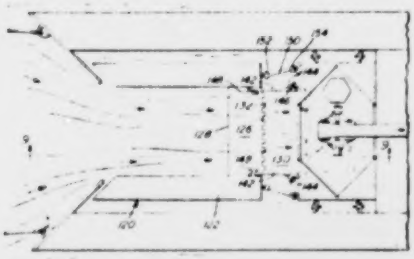
Crisafulli, A. J.

U.S. Patent 3,822,789

The oil skimmer is composed of a sump box having a pump and a free floating weir positioned ahead of the sump box and connected by ball joint connections. The weir rises in relation to the sump box which stays at a constant depth partially below the water surface, and a gravity inlet located on the box receives a thin layer of water and floating pollutants.

Citation Source: Selected Water Resources Abstracts. 1974. 7(21). Entry # W74-11409.

3,822,789
OIL SKIMMER MODULE WITH FREE FLOATING WEIR TROUGH
Angelo J. Crisafulli, Box 1051, Glendive, Mont. 59330
Continuation-in-part of Ser. No. 142,282, May 11, 1971, Pat. No. 3,756,414. This application Feb. 6, 1973, Ser. No. 330,079
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **3 Claims**



P-121-74

PROPELLING ARRANGEMENT FOR OIL AND GARBAGE SKIMMER CRAFT

Derzhavets, A. Y., P. G. Kogan, V. N. Semenov, and V. I. Tabachnikov

U.S. Patent 3,823,828

A propeller arrangement which is effective in the removal of floating impurities from the water surface is described.

Citation Source: Selected Water Resources Abstracts. 1974. 7(21).
Entry # W74-11404.

3,823,828

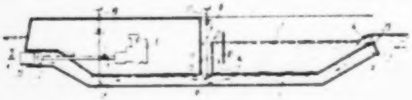
PROPELLING ARRANGEMENT FOR OIL AND GARBAGE SKIMMER CRAFT

Abram Yakovlevich Derzhavets, prospekt Gagarina, 4, kv. 5; Petr Grigorievich Kogan, ulitsa Perekopskoi divizii 2, kv. 14; Vladimir Nikolaevich Semenov, ulitsa Varnenskaya, 19, korpus 8, kv. 29, and Viktor Iosifovich Tabachnikov, ulitsa Varnenskaya 19, korpus 8, kv. 31, all of Odessa, U.S.S.R.

Filed May 8, 1973, Ser. No. 358,360

Int. Cl. B01d *35/02*

U.S. Cl. 210–242 **5 Claims**



P-122-74

APPARATUS FOR AND METHOD OF AUTOMATICALLY REMOVING POLLUTANTS FROM A FLOWING STREAM

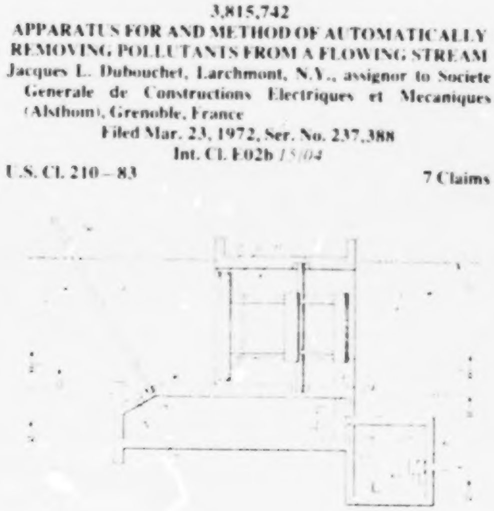
Dubouchet, J. L.

Reproduced from best available copy.

U.S. Patent 3,815,742

Described is a separator which diverts a portion of a stream on which flotsam has collected, into a vertical liquid chamber. The separated liquid is then discharged from its upper portion "while maintaining the level of the liquid at a given constant above the maximum height of any interface that may exist between the liquid and pollutant material."

Citation Source: Selected Water Resources Abstracts. 1974. 7(23).
Entry # W74-12457.



3,815,742
APPARATUS FOR AND METHOD OF AUTOMATICALLY REMOVING POLLUTANTS FROM A FLOWING STREAM
Jacques L. Dubouchet, Larchmont, N.Y., assignor to Societe Generale de Constructions Electriques et Mecaniques (Alsthom), Grenoble, France
Filed Mar. 23, 1972, Ser. No. 237,388
Int. Cl. E02b *15/04*
U.S. Cl. 210 – 83 7 Claims

P-123-74

POLYMERIC QUATERNARY AMMONIUM BETAINES

Fauke, A. R., and R. S. Buriks

U.S. Patent 3,819,589

The compound C_6H_6 containing diisobutylene-maleic anhydride copolymer was treated with Et_3N and ethylene oxide to produce a material useful as a demulsifier for oil-in-water petroleum emulsions.

Citation Source: Chemical Abstracts. 1974. 81(24). Entry #153525x.

P-124-74

APPARATUS FOR RECOVERING OIL SUBSTANCES FROM THE SURFACE OF A BODY OF WATER

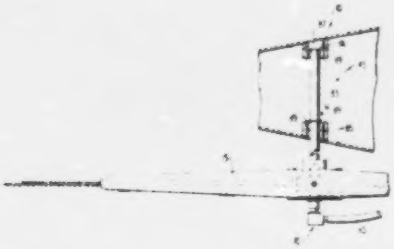
Favret, U.

U.S. Patent 3,836,004

An apparatus for oil removal from the water's surface consists of a buoyant float with oil inlet ports placed at a level to withdraw floating oil substances. An adjacent oil collection suction chamber receives the oil and a remote pump connected to the float provides suction sufficient to withdraw oily substances from the collection chamber.

Citation Source: Selected Water Resources Abstracts. 1975. 8(3).
Entry # W75-01195.

3,836,004
APPARATUS FOR RECOVERING OIL SUBSTANCES
FROM THE SURFACE OF A BODY OF WATER
Uncas Favret, P.O. Box 73095, Metairie, La. 70003
Filed Dec. 7, 1972, Ser. No. 312,913
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **20 Claims**



P-125-74

ROUGH WATER BARRIER

Hoult, D. P., and J. H. Milgram

U.S. Patent 3,802,201

A barrier sheet is maintained in a vertical direction in the water, perpendicular to the wave surface, by flotation elements. The barrier is designed to contain oil or flotsam in rough waters.

Citation Source: Selected Water Resources Abstracts. 1974. 7(20).
Entry # W74-10595.

P-126-74

PROCESS AND APPARATUS OF HANDLING WATER WHICH IS CONTAMINATED WITH AN OILLIKE LIQUID

Jakubek, P.

U.S. Patent 3,836,000

Two pumps, one for clean water and the other for contaminated water, are used to separate the two mixtures. The contaminated water is run through a separator.

Citation Source: Petroleum Abstracts. 1975. 15(3).
Entry #198,897.

3,836,000

PROCESS AND APPARATUS OF HANDLING WATER WHICH IS CONTAMINATED WITH AN OILLIKE LIQUID

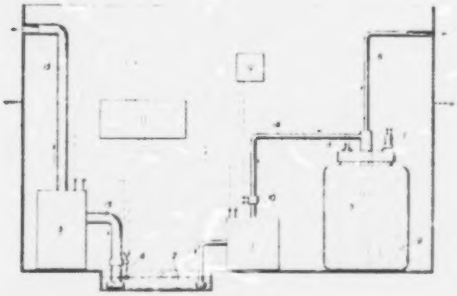
Peter Jakubek, Brunn Am Gebirge, Austria, assignor to Fa. International Pollution Control Systems, Inc., Washington, D.C.

Filed July 8, 1971, Ser. No. 160,779

Claims priority, application Austria, July 13, 1970, 6372/70; Jan. 22, 1971, 534/71; June 3, 1971, 4826/71

Int. Cl. B01d *29/36*

U.S. Cl. 210—104 **18 Claims**



P-127-74
DISPERSED OIL SEPARATOR

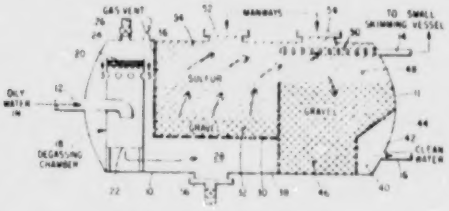
Jones, L. W.

U.S. Patent 3,844,743

Oily water is run through a vessel containing a sulfur media. The sulfur causes the oil to agglomerate; it can then be removed. Water falls by gravity separation below the barrier that collects the oil.

Citation Source: Petroleum Abstracts. 1975. 15(5).
Entry #200,151.

3,844,743
DISPERSED OIL SEPARATOR
Loyd W. Jones, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.
Filed Aug. 9, 1971, Ser. No. 170,172
Int. Cl. B01d *17/04*
U.S. Cl. 55—174 **8 Claims**


GAS VENT
MANWAYS
TO SMALL SKIMMING VESSEL
SULFUR
GRAVEL
GRAVEL
OILY WATER IN
DEGASSING CHAMBER
CLEAN WATER
26
24
20
12
18
34
52
16
54
50
14
48
11
44
42
16
40
46
38
30
32
56
10
22
28

P-128-74
EXTRACTING RETAINED OIL AND SOLIDS FROM A FILTER MEDIUM

Keller, H. F.

U.S. Patent 3,842,001

A granular filter medium that has been used to filter an oil-water-solid dispersion can be agitated in the presence of a surfactant and backwashed to form 3 layers: solids-free oil, useable water, and oil-free solids.

Citation Source: Chemical Abstracts. 1975. 82(8). Entry #45868y.

P-129-74

OIL SPILL CONTROL

King, J. A.

U.S. Patent 3,835,049

The recovery process of an oil slick formed by a spill of a high-gravity crude oil on a bay inlet with the use of linseed oil spray is described.

Citation Source: Chemical Abstracts. 1975. 82(6). Entry #34856s.

P-130-74

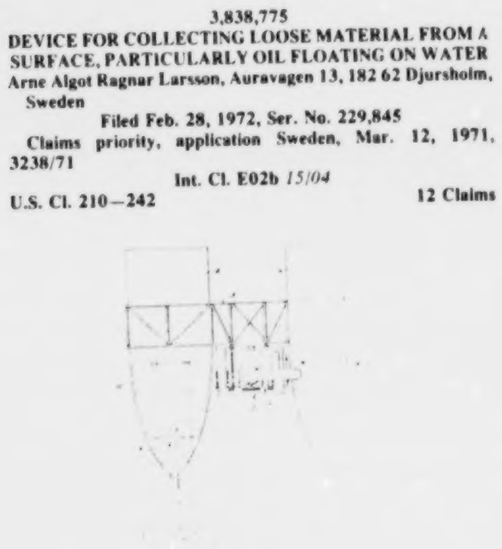
DEVICE FOR COLLECTING LOOSE MATERIAL FROM A SURFACE, PARTICULARLY OIL FLOATING ON WATER

Larsson, A. A. R.

U.S. Patent 3,838,775

This device uses a drum shaped rotor with helical blades that form a central ring of scoops aligned with the discharge duct. The blades move material from the intake opening to the scoops.

Citation Source: Petroleum Abstracts. 1975. 15(1). Entry #198,936.



3,838,775
DEVICE FOR COLLECTING LOOSE MATERIAL FROM A SURFACE, PARTICULARLY OIL FLOATING ON WATER
Arne Algot Ragnar Larsson, Auravagen 13, 182 62 Djursholm, Sweden
Filed Feb. 28, 1972, Ser. No. 229,845
Claims priority, application Sweden, Mar. 12, 1971, 3238/71
Int. Cl. E02b *15/04*
U.S. Cl. 210–242 **12 Claims**

P-131-74
SOLID WASTE DISPOSAL

Lorenz, W. K., E. C. Sebesta, and C. L. McClellan

U.S. Patent 3,835,021

The process by which refinery waste sludge materials are disposed of consists of dewatering and deoiling the sludges by filtering them through a filter press at temperatures between 100-200°F. High recovery of oil from waste materials is possible by using this process.

Citation Source: Chemical Abstracts. 1974. 81(26). Entry #175884r.

P-132-74
METHODS FOR ELIMINATION OF OIL SLICKS

McKinney, R. W., A. L. Dixon, Jr., and R. L. Jordon

U.S. Patent 3,843,517

Freeze-dried mixtures of hydrocarbon consuming microorganisms in a carrier are placed on oil films. The carrier absorbs and concentrates the oil and the microorganisms metabolize it. The microorganisms remain viable for long storage times.

Citation Source: Petroleum Abstracts. 1975. 15(3). Entry #199,494.

P-133-74
APPARATUS FOR REMOVING A SUBSTANCE FLOATING AS A LAYER ON THE SURFACE OF A BODY OF LIQUID

Mourlon, J-C. J., and E. M. R. Dubois

U.S. Patent 3,800,951

Flotsam or oil can be removed from the surface of a body of water by the use of an apparatus in which a screw impeller generates a whirlpool in the area of the substance and causes a downward depression. The lighter substance is then drawn from the depression and delivered to a collection tank with a suction pump.

Citation Source: Selected Water Resources Abstracts. 1974. 7(21).
Entry # W74-11057.

P-134-74

FLOATABLE BOOM STRUCTURE

Oberg, P. O.

U.S. Patent 3,798,911

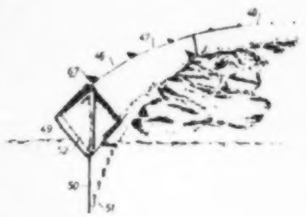
The boom is composed of a series of buoyant tubular body sections, each containing mechanical expansion devices. The tubular body sections, when expanded, are positioned so that they project upward from the surface to contain floating impurities such as oil.

Citation Source: Selected Water Resources Abstracts. 1974. 7(21).
Entry # W74-11054.

3,798,911

FLOATABLE BOOM STRUCTURE

Per Olog Oberg, Sollentuna, Sweden, assignor to Sanera Projecting Aktiebolag, Bromma, Sweden
Filed Mar. 31, 1971, Ser. No. 129,932
Claims priority, application Sweden, Apr. 2, 1970, 4568/70; Aug. 4, 1970, 10704/70; Jan. 27, 1971, 979/71
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **11 Claims**



P-135-74
METHOD FOR TREATING OIL-CONTAINING WASTES

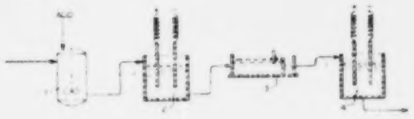
Ohta, M.

U.S. Patent 3,809,631

A method for treating oil-containing wastes is described in which the pH of the waste is adjusted to 3 or less and then the material is subjected to a two-phase electrolytic treatment wherein the oil phase is separated.

Citation Source: Selected Water Resources Abstracts. 1974. 7(23).
Entry # W74-12433.

3,809,631
METHOD FOR TREATING OIL-CONTAINING WASTES
Masanori Ohta, 55 Takehana-Nishinokuchi-cho, Yamashina, Higashiyama-ku, Kyoto-shi, Kyoto-fu, Japan
Filed Mar. 8, 1973, Ser. No. 339,131
Claims priority, application Japan, Mar. 9, 1972, 47/23,558
Int. Cl. C02c *5/12*
U.S. Cl. 204—149 **2 Claims**



P-136-74

APPARATUS FOR CONTROLLING A POLLUTING LIQUID

Oxenham, J. P.

U.S. Patent 3,810,546

A skimmer has been developed, composed of a floating platform with rotatable drums along the periphery. Each drum has a weir positioned adjacent to the interface of the liquids to allow polluting liquids to pass into the drum.

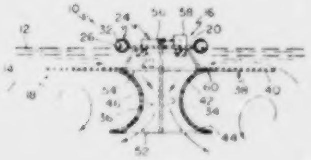
Citation Source: Selected Water Resources Abstracts. 1974. 7(23).
Entry # W74-12436.

3,810,546

APPARATUS FOR CONTROLLING A POLLUTING LIQUID

James Preston Oxenham, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Continuation of Ser. No. 206,544, Dec. 9, 1971, abandoned, which is a continuation of Ser. No. 70,745, Sept. 9, 1970, abandoned. This application Mar. 28, 1973, Ser. No. 345,801
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **1 Claim**



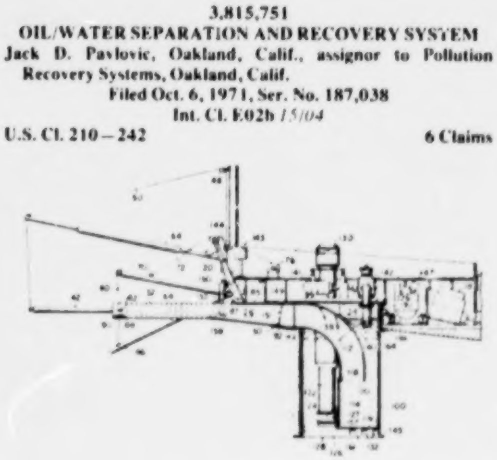
P-137-74
OIL/WATER SEPARATION AND RECOVERY SYSTEM

Pavolvic, J. D.

U.S. Patent 3,815,751

The description of a technique for oil-water recovery using a sectioned separating tank is given.

Citation Source: Selected Water Resources Abstracts. 1974. 7(23).
Entry # W74-12451.



3,815,751
OIL/WATER SEPARATION AND RECOVERY SYSTEM
Jack D. Pavlovic, Oakland, Calif., assignor to Pollution Recovery Systems, Oakland, Calif.
Filed Oct. 6, 1971, Ser. No. 187,038
Int. Cl. E02b *15/04*
U.S. Cl. 210 – 242 **6 Claims**

P-138-74
UNDERWATER LEAKAGE OIL COLLECTOR SYSTEM

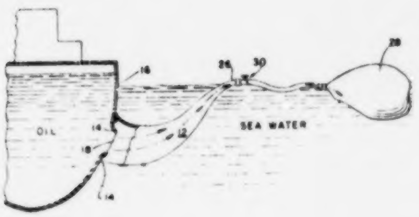
Rainey, D. E.

U.S. Patent 3,756,294

An elongated flexible conduit has been developed to prevent oil leakage from an underwater break in an oil container. The device attaches to the container and entraps the leaking oil, and conveys it to a new collector.

Citation Source: Selected Water Resources Abstracts. 1974. 7(21).
Entry # W74-11056.

3,756,294
UNDERWATER LEAKAGE OIL COLLECTOR SYSTEM
Don E. Rainey, 3209 N.E. 10th St., Pompano Beach, Fla.
Continuation of Ser. No. 124,827, March 16, 1971,
abandoned. This application Sept. 5, 1972, Ser. No. 286,356
Int. Cl. B65b ***3/04***
U.S. Cl. 141—392 **6 Claims**



P-139-74
APPARATUS FOR SALVAGING OIL FROM SUNKEN VESSELS

Rolleman, J.

U.S. Patent 3,831,387

A remotely controlled submersible "pump-house" or salvage capsule is described for use in removing to the surface oil contained in a sunken vessel.

Citation Source: Selected Water Resources Abstracts. 1975. 8(2).
Entry # W75-01038.

3,831,387
APPARATUS FOR SALVAGING OIL FROM SUNKEN VESSELS
Jack Rolleman, Edmonton, Alberta, Canada, assignor to Salvage Oil Systems, Ltd., Edmonton, Canada
Filed Mar. 16, 1973, Ser. No. 342,090
Claims priority, application Great Britain, Mar. 24, 1972, 14091/72
Int. Cl. B63c *11/00*
U.S. Cl. 61—69 A 16 Claims

P-140-74

OFF-SHORE OIL WELL LEAKAGE CONFINER

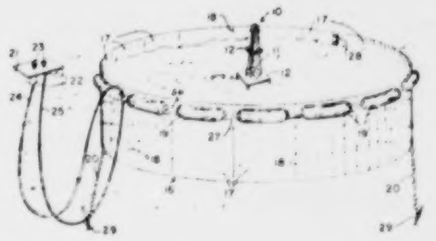
Ryan, M. M.

U.S. Patent 3,839,870

A floating wall supported by pontoons surrounds an offshore well site. The pontoons can be filled with seawater to sink the wall and let ships enter the area.

Citation Source: Petroleum Abstracts. 1975. 15(3). Entry #199,331.

3,839,870
OFF-SHORE OIL WELL LEAKAGE CONFINER
Margaret M. Ryan, 10549 S. Bell, Chicago, Ill. 60643
Filed Jan. 21, 1974, Ser. No. 435,220
Int. Cl. E02b *15/04*
U.S. Cl. 61 – 1 F **3 Claims**



P-141-74

PROCESS FOR REMOVING OIL FROM AROUND A WELL-BORE

Stringer, C. W.

U.S. Patent 3,837,402

Lauric acid and diethanolamine promote oil dispersal. This combination is neither flammable nor toxic, and is biodegradable. Many container interiors and surfaces, in addition to well-bores, can be cleaned with this combination.

Citation Source: Petroleum Abstracts. 1975. 15(1). Entry #198,820.

P-142-74
FLOATING BOOM DEPLOYMENT APPARATUS

Tanksley, N. D.

U.S. Patent 3,807,617

Described is the deployment apparatus for storage, paying out, and retrieval of oil containment booms.

Citation Source: Selected Water Resources Abstracts. 1974. 7(21).
Entry # W74-11046.

B. FOREIGN PATENTS

P-143-74
ABSORPTION OF CHEMICAL IMPURITIES FROM WASTE WATER

Amagi, Y., and S. Inada

German Offenlegungsschriften (unexamined patent application)
2,411,828

The treatment of petrochemical waste water by active carbon in a fluidized bed is described.

Citation Source: Chemical Abstracts. 1975. 82(4). Entry #2142d.

P-144-74
COMPOUNDS COLLECTING OIL AND PROCESS FOR ELIMINATING OIL FROM WATER

Anon.

French Patent 2,203,402

Treatment of beaches or water with compounds containing long chain primary aliphatic alcohols which collect oil or keep it from spreading, can help in oil spill cleanup.

Citation Source: Petroleum Abstracts. 1975. 15(5). Entry #200,247.

P-145-74
FLOATING APPARATUS FOR REMOVING A FLOATING LAYER OF OIL FROM THE SURFACE OF THE WATER

Anon.

French Patent 2,201,691

A floating caisson can remove a layer of oil from water using an adjustable decantation system for the oil and a pump for both the oil and removal of water from the separator.

Citation Source: Petroleum Abstracts. 1975. 15(3). Entry #199,497.

P-146-74
OIL SPILL RECOVERY VESSEL

Anon.

Netherlands Patent NL 7315-128

A vessel for recovering floating oil on water contains a cyclone chamber which receives the inflowing skimmed layer of oil via a lateral opening, one edge having an adjustable skimmer or weir plate. The oil is withdrawn from the larger end of the chamber while the separated water is discharged from the smaller end.

Citation Source: Selected Water Resources Abstracts. 1975. 8(3). Entry # W75-01633.

P-147-74
OIL/WATER SEPARATOR FILTER

Anon.

French Patent 2196-187

The oil/water filter consists of a fibrous core coated with a resin and an outer sheath. The core fibers are made of a textile material laid up in thin layers with fibers side by side and transverse to flow direction; the resin coating, having a higher affinity for oil than for water, acts as a binder within the layers.

Citation Source: Selected Water Resources Abstracts. 1975. 8(1). Entry # W75-00143.

P-148-74
OIL ABSORBENT

Aoso, S.

Japanese Kokai (unexamined patent application) 74 64,577

Oil absorbents used for removing oil from the ocean surface are composed of mixtures of vegetable fibers and waste threads which are dipped into solutions to form fatty acid metal salts on the surface of the mixture. The absorbent absorbs 7.5 times its own weight.

Citation Source: Chemical Abstracts. 1975. 82(8). Entry #47498b.

P-149-74
OIL CONTAINMENT BOOM

Ayers, R. R., and E. V. Seymour

Canadian Patent 958,230

A capture area, in a water surface with relative current velocity, is set up with buoyant float means. Means are also used to slow the flow velocity in the capture area.

Citation Source: Petroleum Abstracts. 1975. 15(3). Entry #199,496.

P-150-74

POLYPROPYLENE ADSORBENT FOR REMOVING OILS FROM WATER

Azuma, K.

Japanese Kokai (unexamined patent application) 74 48,576

An oil adsorbent composed of a 60:15:25 polypropylene-atactic polypropylene-polyetheylene mixture and having a continuous pore structure, was molded and ground into sheet form and immersed in oil. The weight of adsorbed oil was 14,10, and 12 times the original weight of the sheet for heavy, light, and spindle oils, respectively.

Citation Source: Chemical Abstracts. 1974. 81(22). Entry #140659u.

P-151-74

POLYPROPYLENE ADSORBENT FOR REMOVING OIL FROM WATER

Azuma, K.

Japanese Kokai (unexamined patent application) 74 48,577

An oil adsorbent composed of a 70:10:20 polypropylene-atactic polypropylene-polyethylene foam mixture was molded into a sheet form and immersed in oil. The weight of the adsorbed oil was 13, 9, and 11 times the original weight of the sheet for heavy, light, and spindle oils, respectively.

Citation Source: Chemical Abstracts. 1974. 81(22). Entry #140658t.

P-152-74

POLYPROPYLENE ADSORBENT FOR REMOVING OILS FROM WATER

Azuma, K.

Japanese Kokai (unexamined patent application) 74 48,578

An oil adsorbent, composed of a sheet of an 80:20 polypropylene-atactic polypropylene foam mixture placed between two fiber laps composed of the same material and needle punched to obtain continuous pore structure, was immersed in oils. The weight of adsorbed oil was 20, 14, and 18 times the original weight of the mat for heavy, light, and spindle oils, respectively.

Citation Source: Chemical Abstracts. 1974. 81(22). Entry #140657s.

P-153-74
FLOATING ANTIPOLLUTION BARRIER

Ballu, L.

French Patent 2,208,414

A series of compartments connected by flexible tape gives this barrier both flexibility and reliability.

Citation Source: Petroleum Abstracts. 1975. 15(5). Entry #200,249.

P-154-74
PROCESS FOR PURIFYING WATER CONTAINING OILS AND SOLIDS

Beavon, D. K.

Canadian Patent 945,479

Described is a process for removing oil and particulate solids by utilizing a filter media, such as sand, for purification.

Citation Source: Selected Water Resources Abstracts. 1975. 8(2). Entry # W75-00603.

P-155-74
AMINOPLAST FOAM

Blake, A. D.

German Offenlegungsschriften (unexamined patent application) 2,402,441

Patent for a foam-forming mixture used for removal of oil slicks from seawater.

Citation Source: Chemical Abstracts. 1975. 82(8). Entry #44340h.

P-156-74
PROCESS FOR OVERCOMING WATER POLLUTION

Cadron, E. C. A., and L. E. L. Jourquin

Belgian Patent 764,805

Three dimensional bodies of foam with oil pores are deposited on polluted water. The bodies are treated with an agent (chosen from fatty acids and their esters) to make them oil wet.

Citation Source: Petroleum Abstracts. 1975. 15(5). Entry #200,243.

P-157-74
POWDERY FOAM USEFUL AS OIL ADSORBENT

Chono, M., K. Toyomoto, S. Nogami, and N. Matsuo

Japanese Kokai (unexamined patent application) 74 60,323

The composition of a powdery foam adsorbent useful as an oil removing agent from water is described.

Citation Source: Chemical Abstracts. 1974. 81(26). Entry #175845d.

P-158-74
APPARATUS FOR THE REMOVAL OF POLLUTING SUBSTANCES SPREAD ON THE SURFACE OF WATER, ESPECIALLY OF PETROLEUM PRODUCTS

Degobert, P., and F. Kermarrec

French Patent 2,199,755

The walls of the container are flexible, porous hydrophobic, yet easily wetted by the pollutant. Inflatable armatures extend the walls.

Citation Source: Petroleum Abstracts. 1975. 15(1). Entry #198,938.

P-159-74
APPARATUS FOR THE RECOVERY OF POLLUTING PRODUCTS SPREAD ON THE SURFACE OF WATER, ESPECIALLY OF PETROLEUM PRODUCTS

Degobert, P., F. Kermarrec, and Y. Nadaud

French Patent 2,199,776

This apparatus has at least one container with porous hydrophobic walls which are easily wetted by the pollutant. The container floats on the surface; the liquid pollutant is transferred to an interior sealed cavity once it has penetrated the walls of the container.

Citation Source: Petroleum Abstracts. 1975. 15(1). Entry #198,939.

P-160-74
APPARATUS FOR THE RECOVERY OF POLLUTANT PRODUCTS SPREAD ON THE SURFACE OF THE WATER, ESPECIALLY OF PETROLEUM PRODUCTS

Degobert, P., and F. Kermarrec

French Patent 2,203,399

A flexible hose of porous hydrophobic material, which is oil wet, floats at the water surface so the pollutant can easily enter. Both ends of the hose can be towed by ships.

Citation Source: Petroleum Abstracts. 1975. 15(5). Entry #200,244.

P-161-74
APPARATUS FOR THE EXTRACTION OF A LIGHTER LIQUID FLOATING ON A HEAVIER LIQUID

Disque, K., A. Holzgen, and P. Stauch

French Patent 2,208,697

Both liquids feed into a container, then cross a floating baffle. The heavier liquid flows below, the lighter is collected by the baffle. The level of the baffle can be adjusted with ballast.

Citation Source: Petroleum Abstracts. 1975. 15(5). Entry #200,250.

P-162-74
IMPROVING RESIDUAL OIL SEPARATION FROM OIL-IN-WATER EMULSION-BREAKING EQUIPMENT

Dornauf, A., and A. Sorg

German Offenlegungsschriften (unexamined patent application) 2,306,341

The treatment to separate residual oil from acid or salt cracking plant filtrates,or from the purification water in oil-in-water emulsion separation processes in a horizontal or vertical oil phase separation trap, is described.

Citation Source: Chemical Abstracts. 1975. 86(2). Entry #34831e.

P-163-47
APPARATUS FOR THE RECOVERY OF MINERAL OILS SPREAD ON THE SURFACE OF WATER

Drapeau, Y.

French Patent 2,203,400

A movable part in the apparatus, wettable by oil, has a lower section in the water. The upper section is wiped with a ring and the liquid is collected in a gutter. The entire system moves in the direction of a suction zone which has one end at the wiper.

Citation Source: Petroleum Abstracts. 1975. 15(5). Entry #200,245.

P-164-74
AN APPARATUS FOR THE RECOVERY OF MINERAL OILS SPREAD OVER THE SURFACE OF WATER

Drapeau, Y.

French Patent 2,203,401

A movable cylinder attached to a horizontal rotating shaft is wettable by oil. The oil wetted section is then brushed against a wiper and the oil is collected.

Citation Source: Petroleum Abstracts. 1975. 15(5). Entry #200,246.

P-165-74
METHOD AND ASSEMBLY FOR CONTROLLING BLOWOUTS ON OIL WELLS

Erb, B. R.

Canadian Patent 958,328

Liquid carbon dioxide or nitrogen under pressure freezes the pipe and renders the fluid inert and therefore nonflammable and noncumbustible.

Citation Source: Petroleum Abstracts. 1975. 15(3). Entry #199,302.

P-166-74
REMOVAL OF OILS FROM WATER WITH BLAST FURNACE SLAG

Frijii, M., N. Haga, F. Fugita, A. Fujiwara, and I. Hira

Japanese Kokai (unexamined patent application) 74 67,877

Porous blast furnace slag removes oil from water, reducing 35 ppm oil to 1.5 ppm for 120 sec. contact.

Citation Source: Chemical Abstracts. 1975. 82(8). Entry #47501x.

P-167-74
TREATMENT OF SOOT-CONTAINING WASTE WATER FROM HYDROCARBON CRACKING PLANT

Hauptmann, W., P. Jaschke, B. Neumann, B. G. Frenzel, G. Henkel, and J. Slabik

German Patent 106,335

A suspension of waste water containing carbon black mixed with brown coal ash with CaO and FeO is run into a clarification basin. The sulfides in the waste water precipitate.

Citation Source: Chemical Abstracts. 1975. 82(8). Entry #47518h.

P-168-74
SIMULTANEOUS TREATMENT OF SYNTHETIC POLYMER WASTES AND WASTE OILS BY THERMAL DECOMPOSITION

Ito, H., T. Maruyama, and S. Kamimura

Japanese Kokai (unexamined patent application) 74 52,172

A thermal decomposition furnace with a scrubber liquid-gas separator leads to the separation of liquid and gaseous hydrocarbons. The procedure can be done on a large scale.

Citation Source: Chemical Abstracts. 1975. 82(8). Entry #47399v.

P-169-74
NONWOVEN SYNTHETIC FABRICS FOR REMOVING OILS FROM WASTE WATER

Kita, S., and T. Kono

Japanese Kokai (unexamined patent application) 74 66,968

Nonwoven fabrics made from resin mixtures of polyolefin and ethylene-vinyl acetate copolymer have been found to have high adsorptive capacity for oils.

Citation Source: Chemical Abstracts. 1974. 81(26). Entry #175862g.

P-170-74
OIL ADSORBENTS

Kitagaki, T., K. Ogawa, and K. Taguchi

Japanese Kokai (unexamined patent application) 74 47,270

The treatment of waste water containing oils with charcoal and/or sawdust treated with silicon-system water repellants is effective in the removal of oils from the water.

Citation Source: Chemical Abstracts. 1974. 81(22). Entry #140663r.

P-171-74
ADSORBENT OBTAINED BY TREATING CARBON BLACK WITH SILICONE FOR REMOVING OILS FROM WASTE MATERIALS

Kitagaki, T., and K. Taguchi

Japanese Kokai (unexamined patent application) 74 47,271

Carbon black, produced from the incomplete combustion of hydrocarbons, is treated with a hydrophobic agent to form a substance effective in removing oils and fats floating or dissolved in water.

Citation Source: Chemical Abstracts. 1974. 81(22). Entry #140665t.

P-172-74
PURIFICATION OF WASTE LUBRICATING OIL

Koizumi, T.

Japanese Kokai (unexamined patent application) 74 23,801

The process for regenerating lubricating oil from waste lubricating oil by addition of $AlCl_3$ and/or $FeCl_3$ to the waste oil is described.

Citation Source: Chemical Abstracts. 1974. 81(22). Entry #140643j.

P-173-74
REMOVAL OF OIL FROM WATER

Maatschappij, B. V.

Netherlands Patent 72 13,948

A product consisting of long chain primary alcohols and a diluent is capable of removing oil from water. In a test, 19 liters of crude oil were poured into the Houston Ship Channel; ten minutes after the addition of 12 l of the solution, the oil slick was reduced to less than 10% in size.

Citation Source: Chemical Abstracts. 1974. 81(22). Entry #140651k.

P-174-74
RAPID DETERMINATION OF OILS IN WATER BY USING AN ADSORPTION INDICATOR

Miyazaki, Y., and H. Kawaguchi

Japanese Kokai (unexamined patent application) 74 60,788

The operation of an adsorption indicator which measures the oil contents of an oil extract solution placed in a cylinder is described.

Citation Source: Chemical Abstracts. 1974. 81(26). Entry #175855g.

P-175-74
POROUS POLYOLEFIN ADSORBENT FOR REMOVING OILS FROM WASTE WATER

Murayama, N., and M. Fukuda

Japanese Kokai (unexamined patent application) 74 22,392

Porous molded products composed of polyolefin and inorganic materials ($CaCO_3$, $CaSO_3$) and stretched into sheet forms, are useful in removing oils from waste water. Using the sheet as a filter, hexane contained in waste water is reduced from 3 ppm to 0.6 ppm after treatment.

Citation Source: Chemical Abstracts. 1974. 81(24). Entry #158443d.

P-176-74
PURIFICATION OF EMULSIFIED OIL-CONTAINING WASTE WATER

Nakagawa, J., and J. Konoike

Japanese Kokai (unexamined patent application) 74 63,255

Emulsified oil-containing waste waters are purified by a process in which the waters are mixed with a sludge (obtained by neutralizing an acidic solution containing Fe salts with excess $CaCO_3$), stirred, and filtered. The resulting filter cake is solidified to recover oils.

Citation Source: Chemical Abstracts. 1975. 82(6). Entry #34828j.

P-177-74
EMULSIFYING COMPOSITIONS

Nicol, J. R., and G. C. Silsby

British Patent 1,361,179

The compositions of materials useful in dispersing oil spills on water and removing oil on beaches are given: 5-50% ethylene oxide-fatty alcohol condensate dissolved in 55-95% kerosene containing a solubilizing agent .

Citation Source: Chemical Abstracts. 1974. 80(26). Entry #171892u.

P-178-74
OIL ADSORBENT FOR PURIFICATION OF WASTE WATER

Ohkita, J., K. Kajitan, and H. Segawa

Japanese Kokai (unexamined patent application) 74 61,074

Waste water containing 100 ppm oil was passed through oil adsorbents made from polypropylene-polyethylene-nylon fibrils, and the resulting oil content was less than 1 ppm.

Citation Source: Chemical Abstracts. 1974. 81(26). Entry #175861f.

P-179-74
REMOVAL OF OILS FROM WASTE WATER

Ohkita, J., H. Segawa, and S. Kurosaki

Japanese Kokai (unexamined patent application) 74 59,469

Waste water containing 500 ppm oil was successfully passed through a nonwoven fabric-packed column and a synthetic fibril packed column made from a polypropylene-polyethylene-nylon mixture to produce a water containing less than 1 ppm oil.

Citation Source: Chemical Abstracts. 1974. 81(26). Entry #175852d.

P-180-74
TREATMENT OF WASTE OILS

Ohkubo, T.

Japanese Kokai (unexamined patent application) 74 75,601

Waste oils are treated by a method using alkalies and the addition of alcohols, polyglycols and/or polyglycol ethers.

Citation Source: Chemical Abstracts. 1975. 82(4). Entry #21447j.

P-181-74
POROUS GAS OIL COLLECTOR

Ohmori, S.

Japanese Kokai (unexamined patent application) 74 64,578

Mixtures of fine polymer foams and inorganic materials are used to remove oils from waste water. A gas oil absorptivity of 110% is obtained using the collector.

Citation Source: Chemical Abstracts. 1975. 82(8). Entry #47499c.

P-182-74
APPARATUS FOR SEPARATION OF TWO LIQUIDS OF DIFFERENT SPECIFIC GRAVITY

Schilling, G.

German Offenlegungsschriften (unexamined patent application) 2,301,244

Oil layers can be separated from water using this apparatus which consists of a hinged pipe just below the surface of the liquid, and a discharge sluice ahead of a vacuum pump.

Citation Source: Chemical Abstracts. 1975. 82(8). Entry #45707v.

P-183-74
PROCESS AND APPARATUS FOR ELIMINATING OIL OR PETROLEUM PRODUCTS FROM THE SURFACE OF WATER OR OTHER

Sohnius, A.

Belgian Patent 767,980

The absorbent material is hydrophobic and is kept in place with a trellis. The system can be used to form oil spill barriers.

Citation Source: Petroleum Abstracts. 1975. 15(3). Entry #199,495.

P-184-74
CONTACTING PETROLEUM-REFINING WASTE WATERS WITH OXIDIZING AGENTS BEFORE TREATING WITH ACTIVATED CARBON

Takadoi, T., and T. Hatta

Japanese Kokai (unexamined patent application) 74 71,758

An oxidizing agent is contacted with petroleum refinery waste water before activated carbon treatment so as to increase the treating efficiency of the activated carbon.

Citation Source: Chemical Abstracts. 1974. 81(26). Entry #175876q.

P-185-74

DISPOSAL OF SULFIDE-CONTAINING WASTE WATER WITH GENERATION OF SYNTHESIS GAS

Tassoney, J. P., and R. M. Dille

German Offenlegungsschriften (unexamined patent application) 2,304,273

Petroleum refinery wastes are mixed with a fuel and partially burned in a gas generator for synthesis gas containing hydrogen, carbon monoxide, carbon dioxide, water, hydrogen sulfide, COS, methane, Ar, and nitrogen. The synthesis gas is scrubbed by the feed water and hydrogen sulfide gas is then recovered.

Citation Source: Chemical Abstracts. 1974. 81(26). Entry #175841z.

P-186-74

REMOVING OILS AND EMULSIFIERS FROM LIQUIDS

Vostrcil, J.

Czechoslovakian Patent 154,102

"Cationic flocculants increased the sorption effect and output of sedimentation filters charged with perlite type gas and/or silica. The flocculants (.03 mg/g) were added to suspended material."

Citation Source: Chemical Abstracts. 1974. 81(26). Entry #175893t.

P-187-74

SEPARATION FOR IMMISCIBLE LIQUIDS

Worlidge, R. F.

French Patent 2,205,826

An endless belt collects the liquid floating at the surface of a mixed system. The belt is suspended from a drum which rotates, renewing the collecting belt and scraping off the liquid.

Citation Source: Petroleum Abstracts. 1975. 15(5). Entry #200,248.

P-188-74
SEPARATION OF OIL-CONTAINING EMULSIONS FROM WASTE WATERS

Wunnenburger, H.

German (East) Patent 102,371

Waste water containing oil emulsions is treated with foamed polystyrene particles; after agitation, the emulsion is broken with the oil adsorbed on the polystyrene particles, leaving about 25 mg/l in the waste water. The polystyrene is then removed by gravity filtration.

Citation Source: Chemical Abstracts. 1974. 81(22). Entry #140645M.

TOPIC CROSS REFERENCE

Reporting: C-469-74, C-507-74

Monitoring: C-491-74, C-505-74, C-514-74, C-528-74, C-603-74

Remote Sensing: C-483-74, C-547-74

Sampling: C-496-74, C-498-74, C-504-74, C-517-74

Analysis: C-459-74, C-469-74, C-470-74, C-472-74, C-477-74, C-479-74,
C-480-74, C-493-74, C-612-74, C-613-74, C-682-74, C-753-74,
C-766-74, R-110-74, P-174-74

Containment: C-488-74, C-563-74, C-590-74, P-115-74, P-116-74, P-125-74,
P-134-74, P-140-74, P-142-74, P-149-74, P-153-74, P-183-74

Cleanup and Recovery: C-456-74, C-466-74, C-471-74, C-521-74, C-535-74,
C-541-74, C-546-74, C-547-74, C-549-74, C-550-74,
C-598-74, C-658-74, C-686-74, C-700-74, C-701-74,
C-724-74, C-751-74, C-772-74, C-782-74, C-787-74,
R-099-74, R-112-74, P-113-74, P-114-74, P-117-74,
P-119-74, P-120-74, P-121-74, P-122-74, P-124-74,
P-129-74, P-130-74, P-132-74, P-133-74, P-136-74,
P-138-74, P-139-74, P-141-74, P-144-74, P-145-74,
P-146-74, P-148-74, P-150-74, P-151-74, P-152-74,
P-155-74, P-156-74, P-157-74, P-158-74, P-159-74,
P-160-74, P-161-74, P-163-74, P-164-74, P-166-74,
P-173-74, P-177-74, P-182-74, P-187-74

Biological effects of oil pollution: C-449-74, C-467-74, C-562-74,
C-672-74, C-708-74, C-766-74,
R-245-74

Physical effects of oil pollution: R-085-74

Chemical effects of oil pollution: R-085-74

General effects of oil pollution: C-494-74, C-530-74

Design and engineering: C-464-74, C-465-74, C-481-74, C-484-74, C-487-74,
C-490-74, C-533-74, C-538-74, C-539-74, C-540-74,
C-543-74, C-546-74, C-559-74, C-561-74, C-566-74,
C-567-74, C-573-74, C-578-74, C-580-74, C-584-74,
C-587-74, C-589-74, C-662-74, C-663-74, C-669-74,
C-679-74, C-688-74, P-165-74

Oil handling: C-670-74, P-168-74, P-172-74, P-180-74

Waste water treatment: C-572-74, C-585-74, C-585-74, C-727-74, P-118-74, P-123-74, P-126-74, P-127-74, P-128-74, P-131-74, P-135-74, P-137-74, P-143-74, P-147-74, P-154-74, P-162-74, P-167-74, P-169-74, P-170-74, P-171-74, P-175-74, P-176-74, P-178-74, P-179-74, P-181-74, P-184-74, P-185-74, P-186-74, P-188-74

Research: C-562-74, C-706-74

Regulations, standards and planning: C-552-74, C-560-74, C-771-74, C-773-74, C-780-74, C-783-74

Biological effects of oil prospecting and production: C-720-74, C-725-74, C-730-74, C-776-74, C-785-74

General effects of oil prospecting and production: C-709-74, C-712-74, C-714-74, C-716-74, C-717-74, C-721-74, C-782-74

Biological degradation of oil in the environment: C-482-74, C-631-74, P-132-74

Chemical changes of oil in the environment: C-522-74, C-632-74, C-734-74, C-761-74

Physical changes of oil in the environment: C-508-74, C-617-74, C-632-74, C-718-74, C-734-74, C-746-74, C-758-74

General fate of oil in the environment: C-596-74

State legislation: C-697-74

National legislation: C-687-74

International legislation: C-649-74, C-655-74, C-697-74, C-726-74

Foreign legislation: C-698-74

Bibliographies: C-563-74

APPENDIX

Journals Scanned

Abstracts on Health Effects of Environmental Pollutants
Ambio
American Fisheries Society Newsletter
American Fisheries Society Transactions
American Naturalist
Applied Microbiology
Applied Science & Technology Index
Aquatic Sciences & Fisheries Abstracts
Atlantic Naturalist
Audubon
Auk: A Quarterly Journal of Ornithology
Australian Journal of Marine and Freshwater Research
Biological Abstracts
Bioscience
Bulletin of Environmental Contamination and Toxicology
California Fish and Game
Chemical Abstracts
Chemical and Engineering News
Chemical Engineering
Chemical Engineering Progress
Chemical Week
Chemistry in Canada
Clean Air and Water News
Critical Reviews in Environmental Control
Crustacea
Current Contents: Life Sciences
Current Contents: Physical and Chemical Sciences
Ecological Monographs
Ecological Society of America Bulletin
Ecology Law Quarterly
Environment
Environment Abstracts
Environmental Action
Environmental Health and Pollution Control
Environmental Letters
Environmental Pollution
Environmental Science & Technology
Geotimes
Government Reports Announcements
Hydrobiologia
Index Medicus
International Aerospace Abstracts
Journal of Chromatography
Journal of Ecology

Journal of Environmental Sciences
Journal of Experimental Marine Biology and Ecology
Journal of Fish Biology
Journal of Natural History
Journal of Petroleum Technology
Journal of the Fisheries Research Board of Canada
Limnology and Oceanography
Marine Biological Association of the United Kingdom, Journal
Marine Biology
Marine Fisheries Review
Marine Geology
Marine Technology Society, Journal
National Fisherman
National Petroleum News
National Research Council, News Report
National Wildlife
Natural History
Nature
Nautilus
Nippon Suisan Gakkai Shi. Bulletin of the Japanese Society of Scientific Fisheries
Ocean Industry
Ocean Oil Weekly Report
Ocean Science News
Ocean Science on Station
Oceanic Abstracts
Oceans
Oceanus
Offshore
Oil and Gas Journal
Our Sun
Outdoor California
Pacific Oil World
Petroleum Abstracts
Pollution Abstracts
Proceedings in Print
Remote Sensing of the Environment
Research and Development News
Resources
Royal Society of London, Proceedings, Series B, Biological Sciences
Sea Frontiers
Sea Secrets
Science
Science News
Scientific and Technical Aerospace Reports
Selected References on Environmental Quality
Selected Water Resources Abstracts
Sierra Club, San Francisco, Bulletin

The Ecologist
The Engineering Index
The Geological Society of America Bibliography and Index of Geology
Toxicity Bibliography
Underwater Naturalist
Water, Air, and Soil Pollution
Water Newsletter
Water Pollution Abstracts
Water Pollution Control Federation, Journal
Water Research
Water Resources Research: A Journal of the Sciences of Water
Western Fisheries

U.S. Environmental Protection Agency
Industrial Waste Treatment Research Laboratory
Edison, New Jersey 08817

We are requesting your assistance upon receiving this report ("Oil Spill and Oil Pollution Reports, February 1975 - April 1975").

Is the information usable?
Is the format helpful?

We invite your comments and suggestions. Thank you.

cut here

Name__________________________________

Organization____________________________

Address________________________________

affix
stamp

Mr. J. S. Dorrler
Industrial Waste Treatment Research Laboratory
U.S. Environmental Protection Agency
Edison, New Jersey 08817

cut here